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IN THIS ISSUE

DR. STEPHEN SMITH'S ADDRESS AT THE SEMICENTENNIAL BANQUET

FIRST REPORT OF THE COMMITTEE ON MUNICIPAL HEALTH DEPARTMENT PRACTICE

Papers and Reports from the Laboratory, Vital Statistics, Child Hygiene, and Sanitary Engineering Sections, by Mr. Fuller, Dr. Perkins, Dr. Plecker, Dr. Palmer, Dr. Smith, Dr. Lobenstine and Mr. Dittoe.

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THE SEMICENTENNIAL BANQUET

THE fiftieth annual meeting of the American Public Health Association paid homage to its founder and first president, Dr. Stephen Smith, at a banquet in his honor on Wednesday evening, November 16, at the Hotel Astor, New York City.

A distinguished audience greeted Dr. Smith. The program of after-dinner speeches was made particularly memorable by Dr. Smith's participation in it.

Program

DR. MAZYCK P. RAVENEL, *Presiding*
DR. WILLIAM H. WELCH, *Toastmaster*

The Life and Works of Dr. Stephen Smith, DR. MAZYCK P. RAVENEL, *President, American Public Health Association.*

A Half Century of Public Health, DR. STEPHEN SMITH.

The Health of a City and Its Citizens, DR. ROYAL S. COPELAND, *Health Commissioner, City of New York.*

The World Movement for Public Health, DR. HERMANN M. BIGGS, *President, Board of Health, State of New York.*

Stephen Smith, the Man, DR. CORNELIUS WOLFKIN, *Pastor, Fifth Avenue Baptist Church;* DR. J. H. KELLOGG, *Battle Creek, Michigan.*

Lack of space prohibits the JOURNAL from printing all of the speeches of the evening.

The toastmaster's address follows:

DR. WELCH: Dr. Smith, Dr. Ravenel, Ladies and Gentlemen: I do esteem it a very great honor and a very great privilege to have been invited to occupy this position of introducing the speakers this evening. The occasion is one which is almost unique. We have assembled to pay tribute to a man for services in the most manifold direction, of the very highest order, and one who combines with that a measure of longevity which is a source of interest to the whole world.

Such is the combination we find in this man who is about to approach his one hundredth year; for I have just come from a country where he would be called one hundred years of age three months from now, and I think it is quite logical to regard the uterine period of life as a part of the span of life. (Laughter and applause.) When an infant is born in China, it is already one year old. (Laughter.)

It is an occasion, therefore, which, as this great audience here to-night testifies, is of singular, almost unique interest. In fact, I recall only one instance comparable to it, and that is the celebration in Paris at the centennial anniversary of the birth of that great chemist, Chevreux. Whether there is another instance comparable to this, I do not know. There have been other centenarians, but centenarians of comparable distinction is a matter which I think is at least open to question.

The occasion is, therefore, one of the greatest interest. I feel that I shall fill my position as toastmaster best by sub-

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jecting our guest to-night to as short a period of speechmaking and to as few speeches as the occasion permits.

Dr. Smith has been interviewed many, many times for the secret of long life, but I have never heard him include in his prescription for longevity attendance upon public banquets. (Laughter.) He has attended many and survived them, but as I recall it, his prescription was very largely a proper diet taken in moderation. By a proper diet he meant grains, vegetables, and other foods, with meat included only occasionally. He adds that in addition to that prescription, one must have an incurable disease. He told me that for many years he had to take great care of his digestion and digestive organs, and he believes that this care has been a large contributing factor to his longevity.

In addition to that, I suppose the geneticists tell us he has made a very careful choice of his ancestors. (Laughter.) I imagine there is no other factor that counts quite as much in determining the span of life as a careful selection of one's ancestors.

It is my pleasant duty in welcoming you here to-night to spare our guest so far as is possible many speeches and long speeches. The freedom to print is freely granted to all speakers on this occasion. (Laughter.)

* * *

Dr. Mazÿck P. Ravenel read a paper on "The Life and Works of Dr. Stephen Smith." This is included in the Jubilee Volume as a part of Dr. Ravenel's paper on "The American Public Health Association, Past, Present, Future."

At the conclusion of the paper, Dr. Ravenel presented to Dr. Smith a copy of the Jubilee Volume, dedicated to him by the Association, and the gold Semicentennial Medallion bearing his profile.

In accepting these tokens the guest of honor said:

DR. SMITH: Mr. President: Words would fail if I attempted to express my sense of the honor, respect and affection which these tokens confer. The Jubilee Volume contains a record of work in the public interest unequaled in its beneficient results in human history. This beautiful medallion will be a precious heirloom in my family, ever growing more precious as it passes from generation to generation, to the remotest period of time.

* * *

DR. WELCH: We have come to-night to see and to meet the guest of the evening, and the committee, instead of compelling him to listen to himself as the text of many addresses, has decided to make him the next speaker. In calling upon you, Dr. Smith, we, your colleagues, and friends and admirers, the citizens of this great city and state, and your fellow countrymen from far and near, bring you the homage of our sincere admiration, of our highest respect, and of our grateful appreciation.

We congratulate you upon your wonderful life now within fifteen months of the completion of one hundred years. We congratulate you upon this wonderful life so full of good deeds and of noble achievements; good deeds and noble achievements not for this generation alone, but for generations to come, and not in one field, but in many fields.

You have said, Sir, that you will consider yourself cheated if you do not attain one hundred years. How much more shall we be cheated if you do not reach this goal? And in this soul-stirring race, which we trust will run through its remaining span with your continued vigor and joy, you have all of our best wishes.

We hail you, Dr. Smith, as the eminent surgeon, the distinguished sanitarian, the public-spirited, the devoted citizen, the noble man who represents the ideals, the best ideals of our profession, and of citizenship. We hail you, Dr. Smith, our leader and our friend. (Prolonged applause while audience rises.)

A HALF CENTURY OF PUBLIC HEALTH

STEPHEN SMITH, A. M., M. D., LL.D.

Mr. Toastmaster, Members of the American Public Health Association, Honored President, Distinguished Guests, Ladies and Gentlemen:

Words would fail me if I attempted to express my appreciation of the kindnesses and the thoughtfulness that all of the officials and the whole Association have showered upon me, not only since I arrived here, but for many months past.

The tribute which your President, in behalf of the Association, has paid to me, has moved me to the very depths of my being. It is a tribute to the accomplishments of the whole Association, through the entire fifty years of its career, rather than to me personally, although I accept it as my own. And now, this further expression of your affection and esteem, this beautiful and enduring symbol which will, for all time, show future workers in public health how kindly you thought of me!

All I can say is a simple "Thank You." In all my career no honor has come to me that I will cherish more than this.

I regard it as an act of a gracious Providence that I have the privilege of attending and participating in the celebration of these quite unique anniversaries.

To attend the semicentennial anniversary of the Public Health Association and my own approaching centennial, at one and the same time, is an event not hitherto recorded.

Few, if any, of my associates in the great struggle which gave to New York City the Metropolitan Health Law and to the world the American Public Health Association are still living, but "their works do follow them."

The health law and the Public Health Association, united as they were in their primary functions of establishing scientific sanitation, planted the tree whose leaves are for the healing of the nations. I may say with Job's messengers, "I only am escaped alone to tell thee." New York City, then recorded as one of the unhealthiest cities of the civilized world, took the initiative steps in introducing scientific civic sanitation. The code of health ordinances which the metropolitan boards created is unrivaled. The results of its operations in reducing the death-rate were simply incredible. The health commissioner characterized it as "tremendous."

The death-rate gradually fell from 38 per cent, as it was when I began, to 12 in the 1,000 population, a saving of 70 per cent of the lives formerly sacrificed. But this is not all that the new system is accomplishing in conserving the public health of New York City, for only recently the health commissioner announced that the annual death-rate for a certain week had been as low as 8 per 1,000 of the population, which is not only a tremendous result, but it places New York City second, if not first, among the healthiest cities of over a million population in the civilized world.

These officially authenticated facts suggest new and important questions which will confront the managers of the Association as it begins its next half century. The steady fall of the death-rate, until it has nearly reached the vanishing point, suggests the possibility of its passing that point. What a tremendous result! A city of six millions population without a death! Is such a result possible? Evidently this question must be answered in the next half century of the life of this Association.

It is interesting to notice that the tremendous decrease in the death-rate occurred during the increase of the population of the city from one to six millions. How completely does this fact controvert the recent public statement of a prominent clergyman of this city that the "nerve-racking life of New York is not conducive to health and longevity."

The very opposite of this statement proves to be true. It is among the people most engaged in the nerve-racking activities of business that we find vigorous health. Few, if any, persons die of too much activity, while thousands lose health and life by the slowly disintergrating process of idleness.

The most important feature of our celebration of the semicentennial of the Public Health Association centers in the record which the second semicentennial can, or possibly will, make in view of the great accomplishments of the first half. From a somewhat careful review of the situation, I anticipate that the second fifty years of activity of the Public Health Association will excel the first in its life-saving record.

This opinion is based on the quite universal movement among the people to encourage all forms of organization for the protection and promotion of the public health. The child-welfare societies are saving the babies even from their prenatal state through babyhood. Childhood in its development is becoming more and more subject to expert supervision at every stage. The life extension societies and rural clinics are subjecting every grade of the people, and at every age, whether sick or well, to rigid diagnostic examinations in order to discover incipient disease and anticipate treatment in its early stages and most curable period. The domestic pestilences, measles, scarlet fever, whooping cough, are prevented by serum therapy. The New York City sanitary officials are proposing to prevent all preventable diseases. These are but a few of the evidences of the remarkable interest of the people in the public health all along the line, from babyhood to old age. Even old age is classified as a disease by the great scientist, Metchnikoff, of the Pasteur Institute of Paris.

Perhaps the most important impending event favorably affecting the public health in the next half century will be the proposed reorganization of our system of medical education. The great universities of this country have now mutually decided to reorganize their medical schools on the basis of scientific precision hitherto unknown. Harvard, Yale, Columbia, Pennsylvania and Chicago are raising endowment funds for that purpose, incredible in their amounts. Graduates from these schools will have a far higher qualification for the duties of practical and preventive medicine than have hitherto been known. Sanitary officials will be of the highest grade of qualification, and the great medical profession will coöperate in the enforcement of preventive measures in the homes of the people. A most effective measure in the prevention of crime, disease and human suffering is the prohibition law, rigidly enforced, by which alcohol is relegated to its proper place as a medicine, to be used only on the restricted prescription of physicians. Though not yet thoroughly enforced, we are beginning to hear of the marked diminution of crime, insanity and violence, hitherto due to the use of alcohol as a beverage. In a few years of strict enforcement of prohibition I look for a tremendous diminution of crime, sickness and death-rates.

One of the most important and far-reaching public-health measures for the future is the standardization of the health value of every variety of human food, and precise directions as to their uses in health and disease. Dr. John Harvey Kellogg, of the Battle Creek Sanitarium, in his monthly journal, *Good Health*, has been a pioneer in giving the people such accurate familiarity with the special forms of ordinary foods that they are able to adapt foods to their proper daily uses. I learn, also, that there are a score of women's magazines with a combination monthly circulation of fifteen million copies each issue which print much authoritative and expert food and dietetic advice for their readers. "As a man is what he eats," this knowledge is already a powerful factor in promoting the public health. A century ago, this knowl-

edge was unknown even to eminent specialists, as appears from the following incident related by the first Governor Dix. When a young man (1802) he suffered from dyspepsia and went abroad to consult Abernethy of London, the world's greatest authority on diseases of the stomach. In the course of the consultation, Dix inquired, "What shall I eat?" The great Scotch surgeon, who was noted for his laconic speech, and the free use of expletives, replied, "Why, damn it, I don't know; you and God Almighty only know what you should eat."

In confirmation of the belief that this Association has awakened a remarkable interest in public health among the people of this and other countries, I may refer to the following personal experience:

In anticipation of this anniversary the *American Magazine* published a somewhat florid sketch of my life which attracted wide interest on account of my age and profession, and I have been in daily receipt of letters from all parts of the country. Many wish to know the secret of my long life, what I eat at breakfast, dinner and supper; whether I drink tea and coffee; if I use tobacco, wines, alcoholic liquors, and what brand of each I recommend. The writers assume that I have reached my present age because of some special mode of living which they desire to adopt. It is interesting to notice what trivial matters worry people.

A lady cannot digest eggs: Advice: "Cut them out." Another cannot digest milk: Advice: "Drink much more milk." A Texan yawns too much: Advice: "Walk a mile, thus pumping dead air out of and fresh air into your lungs." A young woman has weak ankles: Advice: "Change your peg-heel and pointed-toe shoes for your grandmother's common-sense shoes." Etc., etc.

In view of these evidences of a great awakening of the people of the entire country to the importance of health and to the fact that it is their first duty to secure it, I would suggest that it is incumbent upon this Association to seize the opportunity of placing the public health on a more scientific basis. We have too long been content with the false code of the Mosaic law that limits life to three-score years and ten, with a possibility of reaching four-score years.

The falsity of this law was verified by Moses himself, who lived forty years over his own allotted time and died apparently in good health, for it is written, "His eye was undimmed and his natural force unabated."

We are living under entirely different conditions, with a basic principle of life fixed by the unalterable precision of science. Biology teaches that the normal and potential life of man is one hundred years; that every child born is adapted in physical construction and function to live a century. We must, therefore, infer that, in the natural order of life, all deaths occurring at an earlier age are due to conditions existing which are not compatible with the construction and functions of the human organisms. In these scientific facts we find the present duties and opportunities of this Association. I submit, that on this Jubilee day, we should inaugurate the new era in life saving by moving forward thirty years, our standard for the length of life, and we should summon the sanitary officials and the people to rally round that standard, now permanently fixed by the immutable deductions of science.

Let us prepare a new standard of our work, detailing in simple language which all can understand, this gospel of lengthened life—life that suggests immortality. We seem to be standing on the threshold of a warless world. The nations are vying with each other in getting rid of their implements of war and eradicating the causes of war.

Let us, then, at this most auspicious time, send our messengers into every nook and corner of the whole wide world, proclaiming in schools, churches and legislative halls, by word and press and film, this new scientific standard of long life.

Thus shall we fulfill our duties to the Public Health Association and make its centennial, fifty years hence, even more glorious with its achievement than this semicentennial celebration of its proud record of the past fifty years. (Prolonged applause.)

* * *

In the course of the evening letters from President Harding were read by Dr. Lee K. Frankel and Dr. Royal S. Copeland, of which the following are extracts:

In connection with the semicentennial meeting of the American Public Health Association, I have just learned that a dinner is to be given to Dr. Stephen Smith, the only living survivor of the group which founded the Association, who, in his ninety-ninth year, is still taking an active interest in the work. Dr. Smith's own longevity record is certainly one calculated to impress the practicability of public-health enterprises.

I would be glad, if, at the dinner in his honor, you will extend my congratulations to him and best wishes that he may enjoy many more years of active usefulness.

* * *

It is with much satisfaction that I take the occasion to extend greetings to the American Public Health Association. My understanding is that it is the oldest of like organizations and nearly everybody knows something about the distinguished services it has rendered and the long list of eminent men that have been affiliated with its efforts. Through such work as it has so long conducted, there has been distinguished achievement on behalf of the public interest. Knowing that the work will be carried on, I want to record my wishes for the utmost measure of public coöperation and support in everything that it may undertake.

Very sincerely,

WARREN G. HARDING.

□

What Are the Functions of State Health Departments?—By state sanitation is meant the efforts which state governments exert to prevent insanitary or uncleanly conditions of human environment which tend to impair the health or which are prejudicial to the comfort of the people. Health should be measured both negatively in terms of reduction of sickness and death and positively in the promotion of physical efficiency and ability to enjoy life. "Comfort," in the broad sense, is an important element in health.

The functions of government are force, manifested through the police power, and service, which does for the people those things which the government can do better or more effectively than the people themselves. State boards of health should be concerned with both in a balanced combination. In former years health officials dealt almost solely with matters of police power, such as abatement of nuisances, quarantine of infectious diseases, fumigation, food inspection, and the like. To-day the tendency is in the opposite direction and has sometimes gone to an extreme in fostering welfare activities, such as maternity benefits, various types of clinics and dispensaries, public-health nursing, popular education, etc.

The legitimate functions of state boards include semi-legislative and -judicial functions, such as sanitary codes, regulations for reporting infectious diseases, etc.; laboratory work, including preparation and distribution of vaccines and antitoxins, bacteriological and serological diagnoses of certain diseases, including tuberculosis, venereal diseases, etc.; the giving of friendly advice regarding matters endangering the public health and the promotion of standard methods of procedure without servility; inquiry, investigation, and survey, followed by adequate tabulation and interpretation of facts, as the basis of sound administrative policies and informative official reports.

A great variety of problems—those of water supply and sewerage—while of an engineering nature, have developed as adjuncts of state health departments and should be kept there because of their clear relation to the exercise of the police power in the interests of public health. Their laboratory work is distinct from other types. The sanitary engineer should, therefore, be recognized as the logical head of one of the independent divisions of state boards.—Prof. George C. Whipple, *Public Health Reports*, Nov. 25, 1921, Vol. 36, No. 47, 2879-92.

FIRST REPORT OF THE COMMITTEE ON MUNICIPAL HEALTH DEPARTMENT PRACTICE OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, NOVEMBER, 1921

This is the first installment of the First Report of the Committee on Municipal Health Department Practice, presented at the third general session, Fiftieth Annual Meeting, American Public Health Association, New York City, November 17, 1921. The second part will be published in the February issue. The Committee is planning to issue supplementary reports for each main division of the activities covered

A. Introductory

THE need of authentic information on the practice of municipal health departments of American cities has long been recognized by all engaged in public-health work. It is generally known that a great variety of procedures are in effect; that the organization of the health departments differs in different communities; that the amounts spent per capita for any branch of health service vary considerably and that, in other respects, few standards are available to health officers who would pattern their departments after those which predominate in American practice or achieve most satisfactory results. It was thought that the collection of data as to the current practice of large municipal health departments would repay the effort and that perhaps, out of such an investigation it would be possible to discover the best procedures and to forward the movement for the simplification and standardization of health department practice in our cities. With this in mind, the Metropolitan Life Insurance Company in May, 1920, expressed its willingness to finance the cost of such an investigation, provided that the American Public Health Association would be responsible for the gathering of the information and for the preparation of the report.

The Association, acting through its president, Dr. Rankin, accepted the offer of the Metropolitan and appointed a committee consisting of: Prof. C.-E. A. Winslow, chairman, New Haven, Conn.; Dr. Charles V. Chapin, Providence, R. I.; Dr. Wade H. Frost, Washington, D. C.; Dr. Donald B. Armstrong, Framingham, Mass.; Dr. Allen W. Freeman, Baltimore, Md., and Dr. Louis I. Dublin, New York City, who was elected secretary of the committee. Later Dr. Lewis R. Thompson, of the United States Public Health Service, was added to the committee. For the purposes of this work, the company appropriated a sum of $5,000, and made available, in addition, such assistance of a clerical character as could be given by the Statistical Bureau of the Home Office in the tabulation of the results and in the preparation of the report.

The committee at the very outset limited its inquiry to cities of 100,000 population or over, according to the 1920 census. A few cities close to the lower limit were included wherever the health activities appeared to be of sufficient interest to justify the inquiry. A total of 83 cities were in this way included. The committee prepared a schedule covering practically all phases of municipal health department procedure, and occupying 24 pages, each 12 by 18 inches. It appeared essential that the information should in all cases be obtained by the visit of a personal representative of the committee to each city. Otherwise, many of the questions would have remained unanswered, others would have been misunderstood, replies from various cities would not have been made on the same basis, and the results would have been vitiated through lack of comparability or of reliability. It was, therefore, decided that the surveys should be conducted by a small number of investigators acting for the committee, each using the schedule in the same way and following certain rules and interpretations of the items as agreed upon. The members of the committee each undertook to be responsible

public-health nursing, popular education, etc. 2879-92.

for a group of cities in their immediate vicinities. The Surgeon General of the Public Health Service, Dr. Cumming, was interested in the project and very generously assigned Dr. Lewis R. Thompson of the Service to the committee for a period of ten weeks, in which time he surveyed sixteen cities. In addition, the Surgeon General directed five members of the Service staff, located in various parts of the country, to coöperate with the committee in completing the schedules for nine cities in their immediate vicinities. Altogether, a total of 25 surveys out of the 83 were completed by members of the staff of the Public Health Service. The American Red Cross also coöperated most cordially, placing Mr. Homer N. Calver at the committee's disposal for the survey of five cities. The thanks of the committee are hereby tendered to the Surgeon General, to the several members of the Public Health Service, to the American Red Cross, and to the other volunteers whose coöperation has made this report possible.

The remaining cities were covered by the various members of the committee, their associates, and by various employees of the committee. The following list shows the cities and the persons responsible for the individual surveys.

CITIES STUDIED AND NAMES OF INVESTIGATORS

Dr. C. C. Applewhite, United States Public Health Service:

Atlanta, Ga.	April 4, 1921
Jacksonville, Fla.	April 1, 1921
Savannah, Ga.	March 29, 1921

Dr. Allen W. Freeman, Dr. Charles Armstrong and Dr. E. G. Starr:

Akron, O.	January 24, 1921
Canton, O.	January 22, 1921
Cincinnati, O.	February 15, 1921
Cleveland, O.	February, 1921
Columbus, O.	January, 1921
Dayton, O.	February 10, 1921
Toledo, O.	February 18, 1921
Youngstown, O.	January 31, 1921

Dr. Halsey J. Ball:

Utica, N. Y.	July, 1921

Dr. Wade H. Frost and Mr. Homer N. Calver:

Baltimore, Md.	Mar. 9-April 9, 1921
Norfolk, Va.	April 1-4, 1921
Richmond, Va.	March 29-31, 1921
Washington, D. C.	March 28, 1921
Wilmington, Del.	March 23-25, 1921

Dr. Charles V. Chapin:

Fall River, Mass.	April 21, 1921
Providence, R. I.	February, 1921

Dr. L. I. Dublin:

Los Angeles, Cal.	September 20, 1920
Oakland, Cal.	September 25, 1920
San Francisco, Cal.	September 17, 1920
Seattle, Wash.	September 30, 1920
San Diego, Cal.	October 22, 1920
Portland, Ore.	October 16, 1920

Dr. Charles C. Duryee:

Schenectady, N. Y.	January 24, 1921

Mr. W. T. Fales:

Camden, N. J.	June 9, 1921
Paterson, N. J.	June 15, 1921
Scranton, Pa.	June 11, 1921

Mr. A. W. Fuchs, United States Public Health Service:

Memphis, Tenn.	March 24, 1921
Nashville, Tenn.	March 29, 1921

Dr. Ralph Hendricks:

Spokane, Wash.	June 30, 1921

Prof. C.-E. A. Winslow and Mr. I. V. Hiscock:

Bridgeport, Conn.	December 15, 1920
Hartford, Conn.	November 17, 1920
New Haven, Conn.	December 31, 1920

Dr. F. E. Harrington:

Minneapolis, Minn.	March 24, 1921

Dr. Henry F. Vaughan and Dr. F. M. Meader:

Detroit, Mich.	April 18, 1921
Flint, Mich.	March 3, 1921
Grand Rapids, Mich.	February 3, 1921

Dr. John L. Rice:

Albany, N. Y.	April 6, 1921

Dr. W. K. Sharp, Jr., United States Public Health Service:

Birmingham, Ala.	April 11-14, 1921

Mr. R. E. Tarbett, United States Public Health Service:

Indianapolis, Ind.	May 16-19, 1921
Louisville, Ky.	May 25-28, 1921

Dr. L. R. Thompson, United States Public Health Service:

Chicago, Ill.	March 28, 1921
Dallas, Texas	February 28, 1921

Denver, Colo.	January 31, 1921
Des Moines, Iowa	January 23, 1921
Duluth, Minn.	March 25, 1921
Fort Worth, Texas	March 3, 1921
Houston, Texas	February 24, 1921
Kansas City, Kans.	March 14, 1921
Kansas City, Mo.	March 10, 1921
Oklahoma City, Okla.	March 7, 1921
Omaha, Neb.	January 27, 1921
Salt Lake City, Utah	February 14, 1921
San Antonio, Texas	February 21, 1921
St. Louis, Mo.	March 17, 1921
St. Paul, Minn.	March 23, 1921
Milwaukee, Wis.	January 22, 1921
MR. MAYO TOLMAN:	
Boston, Mass.	February 8, 1921
Buffalo, N. Y.	January 3, 1921
Cambridge, Mass.	March 22, 1921
Elizabeth, N. J.	December 22, 1920-February 2, 1921
Erie, Pa.	March 15, 1921
Jersey City, N. J.	December 16, 1920
Lawrence, Mass.	March 11, 1921
Lowell, Mass.	March 8, 1921
Lynn, Mass.	March 4, 1921
New Bedford, Mass.	March 22, 1921
New York, N. Y.	December 15, 1920
Philadelphia, Pa.	January 15, 1921
Pittsburgh, Pa.	January 5, 1921
Reading, Pa.	January 17, 1921
Rochester, N. Y.	December 29, 1920
Somerville, Mass.	February 28, 1921
Springfield, Mass.	March 15, 1921
Syracuse, N. Y.	December 27-28, 1920
Trenton, N. J.	July 29, 1921
Worcester, Mass.	March 17, 1921
Yonkers, N. Y.	January 31, 1921
Newark, N. J.	June 17, 1921
DR. C. H. VROOMAN:	
Tacoma, Wash.	April 4-5, 1921
DR. C. L. WILLIAMS, United States Public Health Service:	
New Orleans, La.	May 23, 1921

B. GENERAL CONCLUSIONS

The analysis of the data obtained in our survey proved to be a task of considerable magnitude, since the reports from the whole group of 83 cities included altogether more than 50,000 items. In many instances further correspondence with health officers was required after they had courteously devoted much of their time to the surveyor who had visited them in person; and while expressing our very warm thanks to the members of this Association who have aided us, we would warn them that we may yet have to come back for more.

At the present time it has only been possible to prepare a brief summary of the more important of our findings which have been placed in your hands. Special credit is due to Mr. W. T. Fales and Mr. I. V. Hiscock for loyal service in tabulating data and in digesting the material upon which this summary is based. We hope to devote the better part of the coming year to the further analysis of our data and the preparation of a second report covering in detail each of the main functional activities, and of a third report indicating the principal points in the health department practice of each of the cities studied.

As its first report, the committee presents a summary of its findings under the following main divisions:

I. The Health Board and the Health Officer.
II. Expenditures of Health Departments.
III. Control of Communicable Disease.
IV. Tuberculosis.
V. Venereal Disease.
VI. Infant Hygiene.
VII. School Medical Inspection.
VIII. Industrial Hygiene.
IX. Special Clinics.
X. Public Health Nursing.
XI. Public Health Laboratory.
XII. Milk Inspection.
XIII. Food and Drug Inspection.
XIV. Sanitary Inspection and Sanitation.
XV. Water Supply.
XVI. Sewerage and Sewage Disposal.
XVII. Publicity and Public Health Education.
XVIII. Vital Statistics.

Even this summary is too long and too statistical to read in full. We hope you may be interested to study it at leisure; but at present it is necessary only to review in the briefest fashion the most significant of the results obtained.

The crux of good health administration is a good health officer well trained, well paid, efficient and secure in tenure. Three fourths of the health officers of the larger cities are physicians and while only four have a special public-health degree the greater proportion are well equipped from the standpoint of practical experience. Tenure of office appears to be reasonably secure in most instances but the salaries paid are markedly inadequate, but 32 per cent of the cities reporting paying their health officers salaries of $5,000 or over, while $4,000 would be about a median figure.

The total appropriations for the health department vary from 22 cents to $3.18 per capita, and average 98 cents. Both the extraordinary variation and the relatively small amount of these appropriations are significant, particularly when we consider that for strict public-health purposes (excluding contagious disease hospital maintenance, refuse disposal, etc.), the per capita expenditure averages only 52 cents. In the allotment of this health budget, food inspection and sanitary inspection receive too large a share, while tuberculosis, venereal disease and infant welfare receive far too small a share as measured by a standard based on the potential saving of human life.

The most striking feature in regard to the control of communicable disease is the diversity of practice which leads to a completely different method of isolating the same disease in different communities. Hospitalization of communicable diseases is relatively incomplete in most cities. It is surprising to find that two-thirds of the cities reporting still practice terminal fumigation, and that many cities fail to use available cultural methods for the control of contacts.

Although only one-third of the cities report a specific appropriation for tuberculosis work, almost all health departments are attacking this most fundamental problem. Reporting is still very incomplete and in spite of the encouraging development of clinic and nursing service during recent years, the ratio of physicians and nurses is still far too low for ideal results. The low ratio of clinic visits per patient is most significant. Hospital and sanatorium beds are relatively well provided but cases are generally admitted in a stage so late as to be incurable.

The development of venereal disease clinic service is one of the most encouraging facts revealed by our survey, practically every large city being now provided with service of this character.

Infant hygiene work is also done in all of the cities studied, though less than half the health departments have a distinct division of child hygiene. Private agencies are of course doing notable work in this field. The lack of good obstetrical care, of which the rural districts complain so loudly, is to be noted even in our large cities. Better control and training of midwives is an urgent need.

Medical school inspection is carried out in more than half the cities by the board of education rather than the board of health, creating an undesirable conflict of authority, particularly where the health department does inspect children in the parochial schools. The medical and nursing staff is generally inadequate for the most effective work (one physician to 10,000, one nurse to 4,000 children).

Industrial hygiene is an almost undeveloped field for the municipal health department except in two or three of the largest cities.

Public-health nursing is still largely a function of private agencies, although public-health nursing under the health department is growing rapidly so that over a third of the total service of this kind is now furnished by them. Special-

ized nursing is still more common than generalized nursing.

Public-health laboratory service is generally well developed and under good expert direction. The need of the moment is to persuade the physician to make a fuller use of the facilities at his disposal.

Milk control is exercised by practically all cities, but it is surprising to find that pasteurization is not yet general except in the larger cities, and that only some 30 cities have a grading system.

Food and drug inspection is almost always an important function of the health department. It will be desirable in the future to develop more complete systems for the medical examination of food handlers, although it is encouraging to note that 13 cities report 500 or more such examinations per year.

In connection with the control of general sanitation, the energies of the municipal health department are devoted largely to investigating complaints, which task, as suggested, consumes a regrettably large proportion of the department budget. About one third of the cities include plumbing inspection in their activities and a few are charged with the removal of garbage and refuse.

Water supplies are now generally municipally owned and adequately safeguarded in the large cities. The extension of sewerage seems, however, to be a real sanitary necessity in many communities and the better disposal of sewage is often a pressing need.

While public-health educational facilities are becoming more and more widely available, they are not as yet reaching the general public to a productive degree.

Much progress has been made in the use of vital statistics as a part of the health service, but there is still need for the standardization of procedures in the tabulation and analysis of results.

The American municipal health department is an institution whose duties are expanding and whose functions are changing year by year with the growth of the public-health science on which its practice rests, and with the increasing demand from the public for health service of a broad and constructive type.

The health officers of the large cities and of the small cities are striving to realize new possibilities and to meet new demands with energy and enthusiasm; but they realize quite as well as the members of this committee that the ideal and perfect health department is yet far to seek. The best source of guidance is the experience of our fellows. We hope in future reports, by selecting the best procedures in each line of work actually carried out in a given city, and by combining the highest attainments of each of the 83 cities which coöoperated in this study, to present to you a practical ideal which may help in the exercise of the splendid responsibility which rests upon your shoulders as the chosen guardians of the public health of the people.

C. SUMMARY OF RESULTS

1. THE HEALTH BOARD AND THE HEALTH OFFICER

1. The Board of Health.

Public-health work is under the supervision of a special board of health in 42 of the 83 cities studied, the board being composed of from 3 to 13 members. The term of the members varies from 1 to 12 years and special professional qualifications are required for membership in 29 cities. Compensation for board members is provided in 12 cities.

2. Appointment and Qualifications of the Health Officer.

The health officer is appointed by the mayor in 28 out of 75 cities, by the board of health in 24 cities, by some other board or administrative officer in 18 cities and directly by the city council in 7 cities; by civil service in one. In 48 cities he must be a physician, and 64 of the health officers actually possess the medical degree, 4 the degree of Doctor of Public Health, 3 law degrees and 2 engineering degrees. In a group of 64 cities, 31 health officers

(42 per cent) have had over 15 years' experience in public-health work and 8 more (11 per cent) have had from 10 to 16 years' experience.

3. Tenure of Office and Salary.

The position of health officer is protected by civil service regulations in 13 cities. Forty cities report a definite legal term of service for the health officer, ranging from 1 to 5 years. In 27 cities the term of office is indefinite. Sixteen health officers have held their present positions for 15 years, 11 for 10 to 15 years, and 5 from 5 to 10 years. It is of some interest to note in this connection that in 73 cities where the information could be obtained, 47 per cent of the health officers are 50 years old and over.

The health officer is reported as doing private practice in one city of the first group (population 500,000 and over), in one city of the second group (population 250,000 to 500,000) and in 21 of the third group (population less than 250,000).

The largest cities, those having more than 500,000 population, as we should expect, pay proportionately higher salaries than do the smaller cities. Thus we find that 75 per cent of the larger cities for which we have data pay their health officers over $5,000 a year; 60 per cent of the cities of population of 250,000 to 500,000 pay their health officers $5,000 or more, and 17 per cent of the last group of cities pay their health officers $5,000 or more for an annual salary. In the first group of cities the range is from $2,200 for a part time health officer to $10,000 for a full time officer. In half the cities of this group the salary is $7,000 or over.

In cities of the second group, the range is from $4,000 in three cities to $6,500 in one city, six cities paying a salary of $5,000 or over.

In cities of the third group, the range is from $1,200 for a part time health officer to $6,000 in one city, 18 cities paying $4,000 or over, and 18 paying less than $3,000, the health officers, however, being on part time except in two instances.

The following table indicates the detailed situation in the 78 cities for which data were available.

NUMBER OF CITIES CLASSIFIED BY WHOLE AND PART TIME SERVICE AND SALARY OF HEALTH OFFICER.

Cities of population	Total Cities	No. of Cities Health Officer		Cities in which salary of Health Officer is			
		Whole time	Part time	$7,500 and over	$5,000-$7,000	$3,500-$4,999	Under $3,500
500,000 and over	12	11	1	6	3	2	1
250,000 to 500,000	10	9	1	0	6	4	0
Under 250,000	54	31	23	0	9	17	28

II. EXPENDITURES OF HEALTH DEPARTMENT

1. Gross Expenditure.

The gross expenditure of 79 municipal health departments for all purposes ranges from 21.6 cents per capita to $3.18 per capita. The mean is 97.9 cents, the median, 65.6 cents. Fifty per cent of the cities show expenditures between 46.9 and 94.1 cents per capita.

Eighty-two per cent of the health department expenditure in 72 cities is for salaries.

The gross health department expenditures as specified above may be subdivided (for 79 cities) as follows:

A. Health service (exclusive of contagious disease hospitals), 54 per cent.

B. Hospital service (including general, special and contagious), 35 per cent.

C. Garbage and refuse disposal, 8 per cent.

D. Miscellaneous services (morgue, paving, etc.), 3 per cent.

Hospitals of some sort are maintained by the health department in 54 cities, and money is being expended for garbage and refuse disposal in 13 cities.

2. Expenditures for Health Service.

An average expenditure of 52.4 cents is reported for strictly defined health service (exclusive of contagious disease hospitals) in 79 cities. The range is from 11.9 cents in Scranton to 104.9 cents in Bridgeport. Fifty per cent of the cities spend between 33.9 and 58.2 cents per capita. One half of the cities spend less than 43.9 cents per capita.

3. Functional Distribution of Expenditures.

In 72 cities it was possible to distribute the expenditure for health service according to the kind of work performed. The results, as indicated in the following table, give us a very interesting picture of the direction which official health activity is taking at the present day.

It should be understood that all the average figures presented in this summary report are obtained by comparing the total population of all the cities in a given group with the total expenditure or total personnel for the same group. The table therefore presents a picture of the functional classification of health work for the entire population of 72 cities. If we estimated the per capita cost of a service only for the cities where such a service is rendered, the figure would sometimes be very different. Thus the average per capita cost of public-health nursing in 38 cities which maintain and furnish separate public-health nursing budgets is 9.5 cents. Our data will be analyzed from this latter standpoint in succeeding sections where the figures are significant.

III. CONTROL OF COMMUNICABLE DISEASES

1. Organization.

The control of communicable diseases is carried out in the cities studied either (a) by a distinct bureau devoted specifically to that purpose, (b) by a division in a bureau of medical inspection, dealing also with such problems as infant or school hygiene or (c) in the smaller cities, by a medical inspector. Actual field work is carried out mainly by physicians in 10 cities, by public-health nurses in 20 cities, by sanitary inspectors

FUNCTIONAL CLASSIFICATION OF HEALTH DEPARTMENT EXPENDITURE

	Per Capita Expenditure	Per Cent of Total Expenditure For Health Work
Administration	$.053	11.1
Communicable disease control	.073	15.2
Tuberculosis	.015	3.1
Venereal disease	.012	2.5
Infant welfare	.036	7.5
School hygiene	.047	9.8
Public-health nursing*	.016	3.3
Laboratories	.033	6.9
Food inspection	.067	14.0
Sanitary inspection	.091	19.0
Vital statistics	.015	3.1
Miscellaneous	.021	4.4
Total	.479	99.9

*Where special divisions of public health nursing are maintained.

in 28 cities and by a combination service in the remaining instances.

2. Notification.

Typhoid fever, diphtheria, smallpox, scarlet fever, epidemic cerebrospinal meningitis, and poliomyelitis are reportable in all of the 83 cities. Mumps is not reportable in four cities. Chickenpox is not reportable in two cities, influenza not reportable in five cities, pneumonia not reportable in nine cities, and malaria not reportable in twenty cities. Hookworm disease appears to be reportable in all the Southern cities but four.

3. Investigation and Verification of Cases

Practically all cities report the routine visitation of typhoid fever, diphtheria, smallpox, epidemic cerebrospinal meningitis and poliomyelitis, conducted in less than half the cities by physicians. Tuberculosis cases are visited in 50 cities, in 40 instances by public-health nurses only.

Smallpox and chickenpox are the only two diseases the diagnoses of which are commonly verified. These are verified in 61 cities out of 75 for smallpox and in 41 cities for chickenpox (often only in adults). Diagnoses of other communicable diseases are in most cases only made upon request of attending physicians.

Data in regard to laboratory diagnosis are presented in Section XI later on.*

4. Isolation.

The more severe diseases, scarlet fever, diphtheria, and smallpox, are nearly always subjected to absolute isolation, that is, cases are segregated in a separate room with an attendant who has limited contact with the rest of the household. In a second group, including epidemic meningitis and poliomyelitis, we find that most cities report absolute isolation but that a few cities report modified isolation, and still other cities no isolation at all. In typhoid fever, modified isolation is more common than absolute isolation. For other diseases, modified isolation was generally reported.

*To appear in the February issue of the JOURNAL.

5. Hospitalization.

For the 36 cities reporting the actual number of cases of communicable disease hospitalized, we find that 54 per cent of smallpox cases, 42 per cent of typhoid cases, 36 per cent of epidemic cerebrospinal meningitis cases, 23 per cent of diphtheria cases, 19 per cent of poliomyelitis cases, and 23 per cent of scarlet fever cases were hospitalized. For mumps and chickenpox the figure falls to 4 per cent; for measles and whooping cough to 3 per cent.

6. Placarding.

It appears to be an almost universal practice to placard either the house or in the case of apartment houses, the apartment, for diphtheria, smallpox and scarlet fever. Typhoid fever is reported as placarded in 34 cities.

Measles	is placarded in 53 cities.
Mumps	is placarded in 22 cities.
Chickenpox	is placarded in 38 cities.
Meningitis	is placarded in 62 cities.
Poliomyelitis	is placarded in 71 cities.
Whooping cough	is placarded in 41 cities.

Other diseases are placarded only in rare instances.

7. Isolation Period.

The isolation period is terminated in different diseases as follows:

a. Smallpox: Definite time limit* (14-30 days, generally 21 days), 28 cities; recovery or desquamation without time limit, 42 cities; no data, 13 cities.

b. Chickenpox: Time limit (7-21 days, usually 14 days), 38 cities; desquamation, or recovery, 21 cities; no isolation, 10 cities; no data, 14 cities.

c. Scarlet Fever: Time limit (21-42 days, usually 30 days), 72 cities; desquamation or recovery, 8 cities; no data, 3 cities.

d. Diphtheria: Time limit alone, 5 cities; time limit and negative cultures, 26 cities; negative cultures without time limit, 50 cities; no data, 3 cities; no culture, 1 city. Time limits vary from 9 to

*Where a time limit is set, cessation of clinical symptoms is also usually assumed.

21 days, usually 14 days. Where culture release is used, with or without a time limit, 3 cities require one negative culture, 65 cities two negatives, 3 cities three negatives, and in 3 cities the number of negative cultures is not stated.

e. Typhoid Fever: Recovery, 37 cities; time limit, 6 cities; cultural release, 16 cities (in one case combined with time limit); no isolation, 20 cities; no data, 4 cities.

f. Epidemic cerebrospinal meningitis: Time limit (from onset), 32 cities (10-42 days, usually 21 days); recovery, 13 cities; time limit dating from recovery or normal temperature, 7 cities; cultural release, 13 cities; no isolation, 2 cities; no data, 16 cities.

g. Poliomyelitis: Time limit (from onset), 55 cities (14-42 days, usually 21 days); recovery, 10 cities; time limit dating from recovery or normal temperature, 2 cities; no isolation, 2 cities; no data, 14 cities.

h. Measles: Time limit (5-21 days, usually 7 or 14 days), 59 cities; recovery, 6 cities; seven days after rash disappears, 2 cities; no isolation, 7 cities; no data, 9 cities.

i. Mumps: Time limit (9-21 days), 32 cities; recovery, 12 cities; time limit after recovery, 2 cities; no isolation, 18 cities; no data, 19 cities.

j. Whooping Cough: Time limit (14-56 days), 46 cities; recovery, 12 cities; no isolation, 9 cities; no data, 16 cities.

It will be noted that these data relate to the procedure theoretically adopted. In the case of the last diseases mentioned, particularly whooping cough, the actual enforcement of the regulations can occur in only a small minority of cases.

8. Terminal Disinfection.

Practice in regard to the treatment of the rooms occupied by patients is indicated in the table below for 82 cities.

9.—Control of Contacts.

Practice in regard to the control of contacts is indicated in the table below. Typhoid has been omitted from the table as quarantine of contacts is never required; food handlers are, however, restricted in 15 cities, and immunization is advised in 29.

	Smallpox	Chickenpox	Scarlet Fever	Diphtheria	Typhoid Fever	Cer. Spinal Meningitis	Poliomyelitis	Measles	Tuberculosis
Per cent of cities employing routine gaseous fumigation—82 cities	68	2	66	63	7	43	44	4	42
Per cent of cities advising cleansing (with or without fumigation)—69 cities	52	20	51	51	54	44	46	25	46

	Smallpox	Chickenpox	Scarlet Fever	Diphtheria†	Cer. Spinal Meningitis	Poliomyelitis	Measles	Mumps	Whooping Cough
Quarantine*†	81	7	33	11	22	24	2	3	2
Exclusion from school	..	26	38	18	24	20	28	21	22
Exclusion from school (non-immunes only)	..	11	..	..	..	..	23	9	16
Cultural examination	..	..	..	50	12	..	..	..	..
No restrictions‡	..	36	8	2	25	26	23	50	40
No data	2	3	4	2	10	13	7	..	3

*In the case of smallpox, 1 city reports quarantine only, 17 vaccination or quarantine, 15 vaccination and quarantine, 48 vaccination only.

†In scarlet fever and rarely in other diseases, quarantine regulation may be relaxed in the case of wage earners.

‡Four or five cities classified report more or less systematic observation of contacts.

THE INFLUENCE OF SANITARY ENGINEERING ON PUBLIC HEALTH

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FIFTY years ago sanitary engineering in this country scarcely existed, even in name. The larger cities were provided with public water supplies and there was a general desire among sanitarians to supply water free from filth. Sewers in combination with storm water drains had been built in the larger communities to a limited extent for several decades. Some of the more progressive engineers were watching the activities of the Rivers Pollution Commissions in England and at Paris, Berlin and a number of other places abroad. The germ theory of disease had not been established. The laboratory man spoke of chemical tests in terms unappreciated by the engineer and of comparatively little aid to him. Bacteriology had not sprung into being. In brief, the history of the past fifty years tells practically all of the substantial accomplishments of the sanitary engineer in advancing the public-health movement on this continent.

I shall outline briefly what the engineer has accomplished along sanitary lines in the field of water supply, water purification, sewerage, sewage disposal, control of streams and the collection and disposal of solid wastes.

WATER SUPPLY AND WATER PURIFICATION

Fifty years ago most American water supplies were muddy, colored, polluted and frequently objectionable as to tastes and odors. Typhoid death-rates were high. The laboratory men were studying hardness, lead-poisoning and methods of measuring dead organic matter in water.

The art of filtration was practically unknown in this country, except in so far as efforts to get clear water in European cities had been revealed by the classical publication of Kirkwood. This engineer, long identified with the Brooklyn Water Department, was sent abroad in 1866 by the city of St. Louis to investigate foreign practice with a view to planning a plant for filtering the muddy water of the Mississippi. Practically the only outcome of this standard book on filtration was the installation in 1872 of two small water filter plants, at Poughkeepsie and Hudson, New York.

In 1884 the late Professor William Ripley Nichols brought back from Europe a few gelatine tubes and explained to engineers in Boston what the Europeans were doing in their efforts to apply new bacteriological methods to water supply matters. A year or two later, the Massachusetts State Board of Health was reorganized. It established in 1887 an experiment station at Lawrence, under the direction of the late Hiram F. Mills, a distinguished hydraulic engineer who had been made engineer member of the State Board. It was here that the first coördinated efforts were made to lift sanitary engineering into a plane whereby it, with aid of the chemist and of the biologist, with his new bacteriological methods, could expedite practical accomplishments.

In the fall of 1893 the water filter plant installed by the city of Lawrence, Massachusetts, under the direction of Mr. Mills, was put in service and the first bacteriological tests of a modern filter installation in America were reported to a convention of this Association then convened at Chicago.

To the engineer there was a wide difference in the water treatment arrange-

ments needed for the relatively clear waters of the New England States, or of England, as compared with the river waters of the South and West, so heavily laden with silt and clay. In 1895 investigations were undertaken at Louisville, Kentucky, under the direction of the late Charles Hermany, whereby the rapid or mechanical filter was tested in connection with sedimentation and coagulation. Subsequent investigations, embracing a coördinated set of tests of an engineering, chemical and biological nature were conducted at Pittsburgh, Cincinnati, New Orleans, Washington, Philadelphia and other places. The result was a substantial foundation for effective means of purification for the prevailing types of water encountered in this country. Actual construction of numerous sizable plants dates back some twenty years or a little more. During this interval immense strides have been taken in the installation and operation of water purification plants. In this march of progress the sanitary engineer, as might be expected from his earlier contact with laboratory men and the health officers, has played an important part in securing clean and safe water supplies for the American public through provision of proper works.

There are to-day more than eight hundred filter plants in operation in this country and Canada, serving more than twenty millions of people, or more than one-third of the population resident in cities and towns. In scores of cases heavily polluted sources of supply have been abandoned in favor of new and comparatively unpolluted sources.

Typhoid fever annual death-rates of representative cities on this continent ranged, twenty years ago, from about fifteen to fifty per hundred thousand population. In a number of large and well-known cities these figures reached seventy-five to one hundred or more. To-day the death-rates have dropped in many of those same cities, largely as a result of preventing or removing the pollution of public water supplies, to nearly one-tenth of the rates prevailing twenty to thirty years ago. Sanitary engineering has not been the only factor in bringing about this result. It is necessary to recognize the accomplishments in other fields of public health and to appreciate the results of the teaching of improved personal hygiene. Mention must also be made of antityphoid inoculation and other advances in the art and science of preventive medicine. Annual typhoid fever death-rates in large American cities for the past forty years are shown in the table on the following page.

It is hardly necessary here to speak of technical matters in detail, to explain how slow sand filters have been preferred for some water supplies comparatively free of turbidity, or how sedimentation and coagulation in connection with mechanical or rapid filters have sprung into almost universal use for the treatment of muddy waters, so generally found in this country. Laboratory control is an important element in practical accomplishments in controlling the purity of public water supplies, and many of the sanitary engineers of to-day have been well schooled at college and by practical experience in the need of bringing the results of practical laboratory tests to the aid of those who have charge of the quality of public water supplies.

Algae growths have produced offensive tastes and odors at intervals in many American water supplies. The removal of the microscopic growths themselves and of products originating with them can be effectively accomplished by means of aëration in conjunction with filtration.

Some twenty years ago the use of copper sulphate in controlling the growth of microscopic life in surface water supplies was introduced by Dr. George F. Moore. This step was of much practical help and continues to be so from time to time in many places.

About a dozen years ago the so-called sterilization or chlorination or disinfection of water supplies was proposed by Col. George A. Johnson, as a means of removing objectionable bacteria. Its use has become widespread, particularly as a factor of safety to be applied in connection with filtration processes. In many cases, however, its use has resulted in a falling off of the quality of filtered water, largely for the sake of economy during the war period, so that instead of being a factor of safety, chlorination has quite frequently become a substantial portion of the process for the elimination of objectionable bacteria. Undoubtedly the pendulum swung too far, and there is now a pronounced reaction whereby higher accomplishments are demanded of filter plants themselves. This affects the size of sand used in filter beds; the quantity of coagulant; the skill with which filter plants are operated, and other technical details which are receiving deserved attention though not discussed here.

ANNUAL TYPHOID FEVER DEATH RATES FOR VARIOUS AMERICAN CITIES
IN DEATHS PER 100,000 POPULATION

Year	Chicago	Milwaukee	Detroit	Cleveland	Buffalo	Boston	New York [6]	Jersey City	Philadelphia	Baltimore	Washington	Pittsburgh	Cincinnati	Louisville	New Orleans	Minneapolis	St. Louis	Kansas City	San Francisco
1880	34	37	.....	44	.....	42	25	24	58	59	54	135	70	.....	24	.....	40	[7]	34
1881	105	47	.....	99	67	56	38	63	74	58	46	151	71	.....	30	.....	53	.....	37
1882	82	32	.....	68	69	57	32	121	73	47	66	158	55	.....	33	.....	45	.....	61
1883	62	25	.....	65	34	52	32	49	64	35	62	107	51	.....	23	.....	41	.....	64
1884	56	31	.....	60	42	56	29	84	71	42	76	70	56	.....	25	.....	42	.....	58
1885	75	28	.....	34	23	40	27	71	64	42	65	76	42	.....	17	.....	31	.....	44
1886	69	30	39	56	28	34	26	60	64	39	71	68	54	.....	13	.....	30	.....	49
1887	50	31	65	52	34	44	26	54	63	41	78	128	142	.....	15	.....	28	.....	23
1888	47	42	46	47	29	40	23	74	78	42	87	87	70	.....	19	.....	31	.....	33
1889	48	28	31	74	30	43	24	83	71	47	94	95	49	.....	17	.....	33	.....	55
1890	92	41	19	69	40	35	22	98	64	50	112	132	69	.....	21	41	31	52	44
1891	174	33	34	50	51	34	23	100	64	35	82	101	62	.....	24	55	29	42	42
1892	124	30	94	59	34	29	22	72	40	44	89	100	40	.....	20	44	93	33	32
1893	[4] 54	35	42	52	37	31	21	66	41	49	86	111	44	.....	15	76	44	39	32
1894	38	25	28	29	59	29	17	53	33	47	91	56	55	.....	29	56	34	26	37
1895	38	26	24	35	26	33	17	95	40	36	86	78	39	.....	44	48	21	27	34
1896	53	18	23	43	20	31	16	84	34	38	58	62	52	.....	33	32	20	23	26
1897	29	12	15	23	20	33	16	20	33	37	48	64	32	.....	52	78	23	28	19
1898	41	17	22	34	27	34	21	40	46	36	71	73	33	.....	66	44	17	37	41
1899	27	17	13	32	24	30	16	19	75	29	73	111	37	.....	55	36	23	36	22
1900	[2] 20	17	27	54	26	26	21	21	35	35	78	144	39	64	40	39	29	35	13
1901	29	22	21	36	27	25	20	16	34	27	60	125	55	46	48	59	34	35	22
1902	45	15	24	33	33	24	21	20	44	42	78	134	62	61	45	27	37	31	27
1903	32	17	20	114	35	20	17	15	70	36	48	134	42	61	39	42	47	64	24
1904	20	14	20	48	23	23	17	19	53	37	47	142	79	63	36	42	36	30	27
1905	17	23	21	[4] 15	23	20	16	19	48	36	48	99	40	51	32	25	[5] 20	38	24
1906	19	31	24	20	23	20	15	20	74	35	[1] 50	130	70	71	30	34	17	27	58
1907	18	26	35	19	28	10	17	14	61	41	35	125	45	71	55	27	15	33	30
1908	16	17	22	13	20	25	12	9	35	33	37	45	[1] 18	47	33	19	14	28	19
1909	13	23	23	13	23	14	12	9	22	25	33	[1] 23	13	45	[1] 29	[5] 21	16	23	14
1910	14	45	20	19	20	12	12	7	17	42	23	[2] 28	6	[1] 32	32	.....	13	47	.....
1911	11	20	15	14	[4] 25	9	11	8	14	27	22	26	12	24	31	12	16	24	15
1912	7	26	15	[3] 7	12	8	10	8	[1] 13	24	22	13	8	22	14	12	11	11	14
1913	10	12	25	14	15	9	7	11	[3] 16	22	16	20	7	24	17	[1] 12	17	20	16
1914	7	8	11	8	16	9	7	8	8	21	11	15	7	27	22	13	12	15	13
1915	5	5	10	8	10	6	6	6	7	19	11	11	8	14	21	8	[1] 7	8	9
1916	5	16	11	5	11	4	4	8	8	[1] 16	12	9	3	14	23	6	10	11	3
1917	2	6	13	7	10	3	4	4	6	13	12	12	4	16	24	7	8	9	5
1918	2	6	8	[1] 5	7	3	4	5	5	10	11	10	5	15	20	9	8	16	4
1919	1	4	5	3	7	2	2	.....	5	9	4	4	3	6	14	3	6	11	3
1920	1	2	5	3	5	1	2	.....	4	5	6	.....	3	5	7	2	3	8	3

[1]Filtration effective for city.
[2]Sterilization of water supply begun.
[3]Drainage canal in service.
[4]New intake.
[5]Coagulation introduced.
[6]New York includes Borough of Manhattan only through 1898. Since 1898 Greater New York.
[7]After 1899, B'd of F. & W. Comm's, Kansas City, Mo.

DRAINAGE, SEWERAGE AND SEWAGE DISPOSAL

Drainage is an important element in relation to the public health, as shown by the fact that the drainage works installed some twenty years ago at New Orleans had a more beneficial effect upon the health of that community than did the installation in subsequent years of modern sewerage and modern water supply works. In northern climates the engineer has had to deal with drainage to eliminate the mosquito and thus keep under control those diseases that require an insect as a vehicle for their transmission.

Most American cities are now provided with moderately complete arrangements as to sewerage, but after household wastes have been collected the problem of their disposal has been a perplexing one with which sanitary engineers have wrestled in association with other workers in the public-health movement.

A great impetus was given to the installation of sewers some forty years ago as a result of investigations made by Dr. Rudolph Hering for the National Board of Health of this country. Those investigations embraced a comprehensive study of European practice and a clear statement as to fundamental principles involved in the art of properly removing the spent water supply from a community. The undertaking had its origin largely as a result of frequent outbreaks of yellow fever in the Southern cities. While sewerage was thus investigated in connection with an inquiry into the causes of a disease later found to be attributable to other factors, real good was performed in putting under way modern arrangements for removing household and other wastes in a suitable manner.

Water supply is a product which all householders desire and are willing to pay for, but the spent product, after its usefulness has been served, has engaged the attention of comparatively few, and these have seldom included the taxpayer, who frequently considers that money is spent needlessly when devoted to the sanitary disposal of the liquid and solid wastes of the community.

In Eastern states a good deal of attention was devoted to the investigations, commission reports and legislative acts adopted in England forty to fifty years ago. A few scattering sewage disposal plants were in operation in this country before 1890, but it was practically a lawsuit, instituted or threatened by property owners, which alone prompted substantial steps in the field of sewage purification. Here again the Massachusetts State Board of Health, with its experiment station and its sanitary engineers working in conjunction with chemists and biologists, did much to solve the problem of sewage disposal for conditions more or less similar to those in Massachusetts. The Lawrence reports also stimulated inquiries and investigations by numerous other workers both in this country and abroad. It is thirty-four years since the Lawrence Experiment Station was founded and fortunately we have a statement prepared for the engineering congress held in St. Louis in 1904 indicating the progress made up to that date in sewage disposal. Thus we have an opportunity of comparing roughly the progress made during the first seventeen years with that of the second seventeen-year interval since 1887.

In 1904 there were about ninety sewage treatment works in operation in cities and towns of 3,000 population or more, of which the total number in the United States in 1900 was 1,524. At that date about 1,100, or roughly about 75 per cent, of the cities and towns had more or less complete sewerage systems. The 1904 statement as to municipal plants does not include several hundred disposal plants in smaller towns, hotels, institutions and industrial establish-

ments. In 1915 there were over 600 treatment plants for municipalities on this continent and about 300 institutional and private plants for hotels and industrial works. War activities interrupted municipal activities but several important plants have been completed since 1915. Progress was much more rapid during the ten years prior to the outbreak of the Great War than in any decade prior thereto. Not only were many more plants built during the period from 1905 to 1915, but works were provided for larger cities, such as Baltimore, Columbus, Rochester and Toronto, with substantial beginnings made at Milwaukee, Indianapolis and several other larger communities. Since the armistice there has been much activity in the preparation of preliminary reports and completion of other arrangements looking to an active period of building sewage disposal works as soon as financial programs are completed.

Sewage disposal arrangements vary widely in type, depending upon a variety of geological, climatic and stream conditions. Legislative requirements also vary in different states and provinces, but practically all departments of health are now exerting their influence in the direction of clean water courses.

Notwithstanding the systematic efforts towards "river cleaning," the predominating method of sewage disposal has continued to be the dilution method. Within certain limits that are reasonably well understood, and when accompanied by suitable preliminary treatment, this method is fairly satisfactory, although frequently abused and misused.

Seacoast cities and towns, particularly those located near bathing beaches or shellfish layings, dispose of sewage now much more effectively than was the case twenty years ago. Recognition of the transmission of disease by infected oysters and clams and a general demand on the part of the public for clean bathing beaches have had much to do with the adoption of state and provincial laws looking to adequate control of sewage pollution. In general, this betterment has been accomplished by the use of screens, sedimentation tanks, long outfall sewers and by disinfection.

In New York Harbor and in some other tidal estuaries extensive investigations have been made as to dissolved oxygen in the water, a reasonable margin of which is considered important in maintaining clean harbors. Much has been done on the New York and New Jersey side of New York Harbor towards getting under way arrangements for correcting pollutions now found in such a conspicuous degree in certain arms of local waters.

The United States Government at present has very little control over sewage disposal matters. Its jurisdiction is limited practically to preventing the shoaling of navigable waters by sewage solids, and to the protection of government property which it may own on or near the waters in question. The United States Public Health Service has undertaken a comprehensive study from various angles of the pollution of the Ohio River, but the oncoming of the war interrupted steps in the direction of a federal waterways commission.

American rivers in many instances are fortunately very large, but they have not as yet received the benefit of adequate treatment of the sewage or industrial wastes entering them. Sanitary districts or joint sewage disposal projects have been created in quite a number of instances, but not to the comparative extent found in some European districts where river conservancy boards or drainage districts are established on a basis of facilitating real accomplishments.

Along the Canadian border, an International Joint Commission has done much during the past decade in seeking to prevent the pollution of these boundary waters to an extent such that life and property on one side of the boundary is injured by sewage pollution entering the waters from the other side. The

World War, however, interfered largely with practical accomplishments arising from the application of tentative rules of practice.

The so-called "land treatment" was the prevailing method of sewage disposal in New England for over twenty-five years, and still is such in some northern districts where deposits of coarse sand in place are found. Away from the glacial drift formation, sand filtration has been out of the question on account of cost, although in a few instances sewage has been treated in artificial sand beds. Sewage farming or the disposal of raw sewage by broad irrigation, even in semi-arid regions, has not been very satisfactory. The sewage when not needed is frequently diverted to streams or allowed to pool on limited areas, resulting in incomplete purification and offensive odors. Of about seventy such installations, mostly in California, nearly all produce odor nuisances and are sources of net expense due to one or more of the following causes, namely: lax management; unsuitable soil; insufficient preliminary treatment of sewage before its delivery; unsuitable location with respect to isolation; and insufficient land to permit of satisfactory treatment.

Sanitary authorities have taken a strong stand against the use of sewage in an untreated condition for irrigation of lands on which are grown vegetables that are eaten uncooked. Furthermore, objection has been made to sewage irrigation on the basis that disease germs may be transmitted by flies for a considerable distance from the sewage farms.

Chemical precipitation works, which were adopted so frequently in England some thirty years ago, and also by quite a number of American cities, have been largely abandoned on the ground of high cost for results accomplished. New works of this type have not been installed in recent years unless industrial wastes made such a step advisable.

Much progress has been made in methods of clarifying sewage by fine screens and sedimentation tanks in order to prevent rivers, lakes and tidal estuaries from suffering through offensive conditions, due to floating sewage solids and to the decomposition of banks of sewage sludge.

The removal of sewage solids is not the whole story, however, as regards either the disposal in a sanitary way of the sludge or solids themselves, or the purification of the non-settling substances, such as the dissolved and colloidal organic matter and the objectionable bacteria of intestinal origin. Non-putrescible effluents, substantially free of objectionable bacteria, can be secured by the use of several available processes when the plants are not too restricted in their arrangements.

Without going into details of methods now in vogue, it may be noted that in the results accomplished at numerous plants for treating sewage, either in single or two-story septic tanks or by stone beds, which financial considerations have necessitated as substitutes for sand beds, one is frequently surprised with the difficulty of getting efficient results uniformly in an inoffensive way. In part this is due to lax arrangements in the system of collecting sewers; in part it is due to inadequate or overtaxed disposal plants; and in part it is due to inadequate attention in the management of plant operations.

There is no cure-all in the field of sewage disposal. Screens, tanks, sand beds, contact beds, trickling filters, chlorination, activated sludge process are methods, of which each has its place in the satisfactory accomplishment of desired results. Each problem should be solved with due appreciation of local conditions and with the recognition that high grade performance of sewage disposal works involves a cost both for plant installation and for operation on a rather greater scale than was considered necessary a few years ago. This is true, notwithstanding the marked variations in price trends and the cost of both building and operating

works at present as compared with pre-war conditions.

Activated sludge is the newest method. It is a process which makes feasible a more complete purification of sewage than is readily secured by any other method than sand filters. It requires conscientious supervision, but I am beginning to believe that since few, if any, sewage disposal plants are fool-proof, it is perhaps an advantage, rather than a disadvantage, to the process to call for frequent and efficient supervision. During the war, when very high prices prevailed for fertilizers, it was hoped that the drying of activated sludge would produce a commercial product that could be sold to the fertilizer trade for a price which would offset the cost at least of handling the sludge itself. This is not certain under present circumstances, but again we must recognize that this is not necessarily a fatal drawback, and that if real accomplishments in treating sewage are to be effected in a sanitary way, the price must be paid in both money and intelligent direction. Experience shows that results can be produced to equal any reasonable demand, but the price of an adequate plant for the most suitable process to meet the given demand must be paid.

Progress in sanitary engineering in the field of sewage disposal is more associated with availability of funds than perhaps is generally realized. As already intimated, it is more difficult to secure funds for disposing of these waste products than it is to get funds for water supply improvements, or a new hospital, or new playgrounds, or new street pavements. There have been tendencies toward the formation of two groups of sanitarians with respect to sewage disposal. One of these sought quite complete purification at the outset and the other group sought a more gradual or piecemeal program, whereby funds would be applied in the right direction and with a continuing program of actual construction and plant expansion in accordance with comprehensive plans. Prior to the war the latter method was generally considered the more effective on the basis that if funds on too big a scale were sought nothing at all was accomplished in a practical way. The war upset the situation as to progressive betterments, with the result that numerous sewage disposal plants are now greatly overtaxed and funds are not immediately in sight for improving them.

STREET CLEANING AND DISPOSAL OF SOLID WASTES

These subjects are properly included in the scope of sanitary engineering and in this country progress has been substantial. Accomplishments for the most part have followed European precedents, but have not attained as satisfactory results, generally speaking, as found in the better known European cities. A good resumé of developments as to garbage and refuse disposal is to be found in the *Proceedings* of this Association, containing reports of a committee of which Dr. Hering was chairman for many years, beginning in 1887.

The epidemic of infantile paralysis in 1916 and the outbreaks of influenza during the war stimulated street cleaning in some cities to a substantial extent; but depleted funds and restrictions in capacity of water supply works have caused some municipalities to fall back to a standard of accomplishment lower, rather than higher, than that prevailing just prior to the war.

The United States Food Administration during the war made a strenuous effort to avoid waste and secured comprehensive data as to garbage utilization from cities of 10,000 population or more.

These data were summarized in *Engineering News-Record*, October 17, 1918, by Mr. M. N. Baker, who is now chairman of the committee of this Association dealing with refuse disposal.

Garbage collection was systematically handled in 1918 in 526 of the 785 cities. It was found that 382 cities, with a com-

bined population of nearly 30,000,000 were then feeding garbage to hogs, or reclaiming from it fats and fertilizer by means of reduction works. Reduction plants were operated in 37 cities having a population of about 18,500,000, so that garbage was fed to hogs in 345 cities with a total population of about 11,000,000.

Of the 316 cities not utilizing their garbage, 102 incinerated it in furnaces, and 214 reported what has been designated as the "burn, bury, or dump" arrangement, which varied widely in its detail and included both land and water dumping.

Since the war, with a marked drop in the price of hog meat and of grease and of fertilizer, things have changed materially and again the problem has become one, generally speaking, of avoiding a nuisance. Prospects of substantial profit scarcely exist at present.

The most effective way of avoiding a nuisance from solid wastes from the viewpoint of the sanitary engineer is now by incineration. In this country low temperature and high temperature furnaces have been used. The former have predominated and the performance depends largely upon the temperature obtained through the addition of fuel.

The high temperature incinerator is the most reliable method for disposal of solid wastes in a sanitary way. The gases may be used profitably for firing steam boilers, particularly if additional boilers, fired with other fuel, are also provided.

The sanitary engineer is able to bring about in an effective way the sanitary disposal of solid wastes. Overtaxing of plants and difficulties from odors have been more pronounced than should have been or need be the case. Even in garbage reduction works the control of odors by passing the released gases through combustion chambers maintained at a very high temperature and their passage through curtains of water spray are things which the engineer knows about but which have not ordinarily been put in practice.

In conclusion, it may be said that substantial accomplishments in sanitary engineering during the past fifty years have been made in plant installations, in coördination with the efforts of other workers in the public-health movement. Much has been accomplished also in developing sound bases for procedure; but much yet remains to be done, especially in practical application in the rapidly growing portions of our country.

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THE WIDER DEVELOPMENT OF STANDARD METHODS

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Address of the Chairman, Laboratory Section, Fiftieth Annual Meeting, American Public Health Association, New York City, November 14, 1921.

IN the world of machinery the United States is the leader in the development of standardization of methods and of manufactures. The interchangeability of parts and the consequent ease of repair in case of injury has had much to do with our mechanical preëminence. This has become so much of a habit that we are often accused of standardizing men into machines, and at times the accusation is well enough founded.

There are still places in our scheme of development in which this principle can be carried further, and it is of one of these that I wish to speak to-day. It is somewhat paradoxical, yet none the less true, that while laboratory methods are much in need of improvement in this direction, yet they are at the same time among the most difficult to handle. The constant comparison of work in one laboratory with similar work in another,

whether the results are to be used in research or in court cases, makes a common basis essential for acceptance of results; yet the technic on which these results are based must always remain in flux and the standards can never be final. None the less they may serve as a basis, all variations from which must be noted, and when so noted may be properly estimated.

Consultation of the literature on any branch of laboratory technic shows by the vast array of methods recommended that none is perfectly satisfactory, but none the less, by a natural process of selection and exclusion, certain principles have been accepted as fundamental, such as differentiation of bacteria by fermentations, the relation of the hydrogen-ion concentration to the growth of bacteria, and similar complexes which have become axioms of our everyday laboratory life. Yet in their practical application there is no real uniformity of method, although they are at our command as a foundation for standards and variations.

The need for further unification has long been clear, but the stimulus of this need has in the main set up only local reactions. State laboratories with many branches have found identity of technic necessary for proper correlation and summarization of results, as brought out by Wadsworth last year in his address to the Section, and by others. Various associations such as the Agricultural Chemists, the Water Works Association, bureaus in the Federal Government, etc., have tried to establish standards in their own lines of work, and with such success that many of their results are accepted far beyond the limits of the original group.

Each of these, however, while interested in some phase of public-health laboratory work, has been limited in its sphere of action, and it was apparently the clear duty of the American Public Health Association to begin a wider process. When the Laboratory Section was founded in 1899, a Committee on Standard Methods of Water Analysis was formed with George Fuller of New York as its first chairman. A preliminary report was made the next year and published in the *Engineering Record,* as it was decided to delay the publication in the official records of the Association until opportunity had been given the members for criticism. Since that time the Committee, with changing personnel, has been most active and has prepared a series of reports, the last of which is now in the hands of the Section. It was not until 1905 that S. B. Prescott suggested a similar committee on milk and was selected as its first chairman. This committee made its first report two years later, and has since presented a series, of which the last has recently been printed. In 1907 the interest in the reports of the two committees was sufficient to stimulate the Council of the Laboratory Section to appoint a further group of committees, some of which no longer exist, while others were added as occasion arose. In 1920 there were committees on Water and Sewage, Milk, Shellfish, Air, Preparation of Anti-meningococcus Serum, Diphtheria Antitoxin, Tuberculin and Mallein.

These committees were appointed annually by the Council of the Section, and often rather hurriedly. They reported to the Section either in the form of progress reports, or with more detailed reports and requests for permission to print. Some of them found their work opened a new field while others found that various degrees of activity were already to be found outside the Association, and it is to the credit of the committees that they stimulated coöperation from the beginning.

As was natural, the work of the different groups varied in intensity, more or less according to the urgency of the need. Some of the committees were in fact appointed to meet emergencies and the reason for their existence lapsed at the same time as the emergency. Others, and notably the milk and water commit-

tees, had their work cut out for them, to select from the multiplicity of changes claimed as improvements those which were really such. In the same way and for the same reasons, some reports were published only in the columns of the official JOURNAL, while others required the printing of a large number of separates to meet the demand.

It was seen that the same group of men appeared in many of the committees, and also that the lack of income made the carrying on of investigations a burden too serious for some of the less well financed laboratories. For these and other reasons it appeared to many in the Section that some of the troubles could be diminished and some of the best features stimulated by the formation of a standing Committee on Standards, which would control and correlate under one authority the various activities formerly scattered among a number. This idea was presented as a part of the 1919 report of the Committee on Standards for Bacterial Analysis of Water and a committee was appointed by the Section, with F. P. Gorham as chairman, to draw up the necessary amendment to the Constitution of the Section, and presented its report at the 1920 meeting. This report was accepted and the Committee is now in existence and functioning. It is composed at its beginning largely of the chairmen of former separate committees to promote continuity.

The Section has approved the plan, and the degree of success of the Committee is in its hands. The Committee reports to the Section, and the Council of the Section selects the members of the Committee; so that it is clear where the ultimate responsibility lies. The efforts of your new committee must be largely along the lines of critical stimulation of investigations leading to improvements of methods, and in many cases its members will have no contact with the actual work done. This last will be entrusted to referees selected by the Council on recommendation of the Committee, and their activities will be comparable to those of the former special groups. It is worthy of note that there is no restriction on the selection of the referees, who need not even be members of the Association. In practice their work will come first before the men best qualified to judge of that particular phase of the work, and then before the Section. The changes adopted by the Section will remain on trial for a year before adoption, but will be made available to all in order to get the most efficient criticism.

It should be the main effort of the Committee to carry out the original idea of developing a set of standard methods which shall be the accepted form, and which, while always open to improvement, shall not be altered until such improvement shall have been proved.

The word "coöperation," like "welfare," "efficiency," and similar characterizations, has been used almost *ad nauseam* and yet we have no good substitute. There are certain main phases of public-health laboratory work in which the main experimentation has been done through organizations to which health is not a prime function, and who have little interest in its more general questions. The very multiplicity of their work-places and the large number of their tests drive them more rapidly to a standard than is the case with others. The very fact that their relation to health is often remote, and that at times they feel themselves on the defensive, brings out differential points neglected by the health laboratories. This has already been appreciated by the former officers of the Section, and should be continually appreciated by their successors. The coöperation so well begun should be extended so that there can be no feeling that any one has been slighted or that his ideas have not had fair consideration, for there are still advances possible. When the Association and the Public Health Service have different standards for the determination of the potability of water,

even though the technic of the work be the same, there is a confusion in the minds of the laity, and with the confusion a natural tendency to a lack of faith in either one.

It should also be the policy of the Committee, and through the Committee the policy of the Section, that in all reports the full and proper credit be given to the actual person doing the work, and to the Association with which that person is connected, and that the Standing Committee should appear as an agency correlating the various investigations. The facts that in the past much of the work has been done by persons and groups whose interests were not primarily in the Association, and that much work in the future will be done by the same or by similar groups, make it most important that the American Public Health Association should not appear to consider itself in any way the only organization fit to present standards, but rather as the organization which by its wide contact with all phases of public-health work is privileged to offer its services to bring together and make more available some of the special investigations.

And finally, there is the problem of making available the standards to which, let us say, optimistically, all the technical groups will assent. So far the practice has been to publish short reports in the JOURNAL, especially when they constitute only progress reports, and to bring out as separates the more important ones. This last is essential and is to be encouraged, but is not sufficient. There are two groups of persons to whom standard methods are important. On the one hand is the group with which we have been dealing, namely the persons who are actually to use these methods in their daily work or who are dependent on the results obtained from them for modifications of their organization or policy. This is the group for which the separates are prepared, and of course far the larger section of those interested. But there is another group, also very important, though perhaps less in the public eye. By this group men are prepared for the posts in which they are to use the methods under consideration, and it is clear that the easier it is made to teach standard methods the better they will be taught. At present there is no suitable text book for instruction of a class in public-health laboratory methods. There are of course excellent descriptions of some of the methods in the text books on bacteriology and hygiene, but we all know that in many respects a text book may be out of date before it is printed, and also that a frequent revision is something not lightly undertaken. It is true of course that in many cases the technical assistants just grow, like Topsy, by assisting their superiors until some accident pitchforks them into posts, in which they do more or less well; but in any case they are limited in point of view and breadth of vision to what they may have absorbed from their teachers. It is perhaps one of my obsessions that the modern tendency to limit the outlook of a worker to some small phase of the work is wrong, and accordingly it is my belief that the broader and more illuminating relations, which are brought out only where a teaching institution is the source of the instruction, and where more than the actual technic in hand is included in the lesson, should be emphasized.

More and more schools have developed courses in public-health bacteriology. Such courses are given in more and more institutes and in state after state courses are given actual or prospective health officers. All this teaching is more or less hampered by the absence of an adequate text, and it seems that it might well be one of the functions of the new Committee to furnish assistance.

Difficulties spring at once to the front. The first objection is that there are many groups which are interested only in a specialty and who prefer separates. This

is quite true and it would be unfortunate if the issuing of a full text should interfere with these. I am inclined to believe, however, that a text-book would call the attention of many to the fact of the standards, and that it would create a demand for additional separates of kinds which are now not called for. It is stated that there are many of the much-used technics which are at present incapable of standardization. This is undoubtedly true, though even concerning the Wassermann test there are marked differences of opinion in this connection. But in any text-book there must be reference to matters which are not well determined; yet the book is not of less value for that reason. The most valid objection is that there is constant change and that a book would soon lose its accuracy. This is of course true, but if an edition were issued, say every three years, complete as far as possible up to date, there would be much in it that would be settled, and what was subject to change would be modified from time to time by the referees of the Association, presented to the Section, and printed in the JOURNAL as soon as accepted, thereby becoming available. All the persons who taught these courses would of necessity become members of the Association and would thus be kept constantly in touch with its work. Incidentally this necessity is a distinct stimulus to a teacher.

The financial problem is also of great importance. There is now a certain profit accruing from the sale of separates, and while it is true that no additional financial burden should be placed on the Association, it is proper that the profit on publications stimulated by the Committee should revert to the Committee. Moreover it is similarly proper that no overhead should be calculated as a debit which is not directly caused by the preparation and issuing of the material published. If the investigations are to be properly carried out, it is clear that at the best there will not be sufficient income from this source, and it would appear reasonable that a committee with the breadth of aim planned by the Section would have a better chance of obtaining outside funds than any of the original smaller subdivisions.

In summation, the problem before the new Committee involves a continuation and expansion of the policy of obtaining by mutual compromise a set of standards which will be acceptable to all organizations working in these lines. It also involves the publication of the results in such form or forms as will make them most widely used and most constructively criticized. To these ends it is essential that we appreciate that no one group is infallible, but rather that it is only by coöperative contact of groups with differing primary interests that ultimate success will be obtained.

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REPORT OF THE COMMITTEE ON STANDARD METHODS

Read before the Laboratory Section of the American Public Health Association at the Fiftieth Annual Meeting, New York City, November 14, 1921, and adopted by the vote of the Section

AT the New Orleans meeting of the Association, a committee with Dr. F. P. Gorham as chairman, was appointed to draft an amendment to the constitution of the Laboratory Section, consolidating the various committees on standard methods into one. The report of this committee was submitted, and at the San Francisco meeting was adopted by the Section as follows:

REPORT OF THE COMMITTEE ON THE APPOINTMENT OF A STANDING COMMITTEE ON STANDARD METHODS

1. The various committees on standard methods of the Laboratory Section of the A. P. H. A. shall be abolished, and the Council of the Section shall appoint a standing committee on Standard Methods from the members of the Section who are federal, state, or municipal officials. This committee shall consist of nine members, three to serve three years, three to serve two years, and three to serve one year, and thereafter three members shall be appointed by the Council at each annual meeting. The committee shall have power to appoint its own officers. All matters pertaining to the adoption of standard procedures by the Section shall be referred to this committee. It shall be the duty of this committee to edit and to publish all provisional and standard methods approved by the Section. The necessary expenses of the committee shall be defrayed by funds derived from the sale of such publications.

2. The Committee on Standard Methods shall have power to appoint one or more referees, not necessarily members of the Section, whose duty it shall be to investigate any new methods or modifications of standard methods. The referee shall have the power to appoint any number of assistant referees to aid in their investigations. It shall be the duty of referees to distribute samples and reagents, to formulate all methods or tests to be used, to furnish blanks for tabulating results and to present at the annual meeting of the Section an advisory report on the results of the work done, together with recommendations for action by the Section. Each referee shall forward to the chairman of the Committee on Standard Methods at least one month before the meeting of the Section his recommendations and an abstract of his report.

3. No method shall be adopted by the Section until it has been referred to the Committee on Standard Methods, reported on at a meeting of the Section by a referee, and recommended by the Committee on Standard Methods. It may then be adopted by the Section as a provisional method and shall be published as such by the Committee on Standard Methods. A provisional method shall be referred again to a referee, reported on by him, and may then be adopted by the Section as a standard method and published as such by the Committee on Standard Methods.

Owing to the small number of Council members present, and the importance of the question, A. B. Wadsworth, chairman of the Section, thought it best to omit the Council meeting at that time, and leave it to the incoming chairman to call a meeting at a later time, when fuller representation could be obtained.

It was not until December, 1920, at the Chicago meeting of the Association of American Bacteriologists, that this was accomplished, but at this time a meeting was held at which were present: Edward Bartow, A. P. Hitchens, C. A. Shore, R. G. Perkins, C. A. Williams. E. O. Jordan was unable to be present, but was consulted before and after the meeting and gave his approval. A. B. Wadsworth, L. A. Round and B. L. Arms were not in Chicago.

The constitutional amendment was discussed, and in view of the fact that Section I dealt with the general finances of the Association, Mr. Hedrich was invited to be present.

The selection of the membership of the new committee was made with two ideas in mind, one that the various groups, federal, state, municipal and university should be represented, and one that the geographical distribution should be wide enough to get different points of view without being so wide as to make discussions and meetings impossible. The personnel finally selected was as follows:

Henry Albert, appointed for 3 years.
R. S. Breed, appointed for 1 year.
F. P. Gorham, appointed for 3 years.
A. P. Hitchens, appointed for 1 year.
E. O. Jordan, appointed for 3 years.
G. W. McCoy, appointed for 2 years.
W. F. Monfort, appointed for 1 year.
W. H. Park, appointed for 2 years.
Chairman, R. G. Perkins, appointed for 2 years.

After the selection of the committee the main questions were the principle of selection of referees and their status,

and the financing of the work. Although the Council appreciated that these details belonged, strictly speaking, to the committee itself, it felt that a discussion of such policy would be illuminating, especially as several members of the new committee were present.

With regard to the first question, it was agreed that until all reports of the old committee which were still in preparation were completed and handed in, the chairmen of such committees, unless already on the central committee, should act as referees and the rest of the committee should act as assistant referees. This action was really necessary, inasmuch as the appointment of referees takes place only at annual meetings, the next annual meeting being the present one; an interim arrangement was therefore essential.

In regard to the finances, the secretary of the American Public Health Association stated that the clause reading, "It shall be the duty of this committee to edit and to publish all provisional and standard methods approved by the Section," was in contravention to an unwritten law of the board of directors, keeping all such control in the hands of the general Association. It was, however, the opinion of the Council that it was not fair to impose expenses on the referees when this could be avoided, and that inasmuch as publication of the standard methods was a good publicity measure for the Association, such publication should be stimulated whenever possible.

The secretary agreed to bring the matter before the board of directors and to urge that whatever money could appropriately be turned over to the committee should be so used.

During the early part of 1921 the chairman sent a circular letter to the members of the committee, embodying certain suggestions for the policy of the committee.

In this letter the main thesis was the publication every three years of a single volume containing revisions of standard methods up to date, for teaching purposes mainly, with the idea that this would extend the knowledge of standard methods and make them more used, thus stimulating criticism and improvement, and that the adoption as a text-book in the better medical schools would stimulate interest in the Association. It was also brought out that such a procedure would in no way interfere with the printing of separates, as there are many groups interested only along certain lines. Changes in the interim period between editions could be readily cared for by instructors, and the need for this would assist in keeping them up to date. These changes could be published in the JOURNAL when approved and thus made accessible.

The letter also brought out the need of finances, especially for assisting in expenses of referees, the money for this to come in part from publication profits and in part from outside sources if any such can be interested.

Answers were received from the members of the committee favoring these general principles, and the general consensus of opinion was that until the present meeting it would not be practicable to do more than get together the work already nearly complete, and then lay out our plans for the future.

The committees appointed in 1919 at New Orleans and their chairmen were as follows:

Committee on Standard Methods for the Bacteriological Examination of Milk, W. H. Park, chairman.

Committee on Influenza, W. H. Park, chairman.

Committee on Standard Methods for the Bacteriological Examination of Shellfish, P. D. Parsons, chairman.

Committee on Standard Methods for the Examination of Air, C.-E. A. Winslow, chairman.

Committee on Standard Methods for the Bacteriological Examination of Water and Sewage, F. P. Gorham, chairman.

Committee on Standard Methods for the Chemical Examination of Water and Sewage, W. L. Monfort, chairman.

Committee on Standard Methods for the Preparation and Standardization of Antimeningococcus Serum, C. Krumwiede, Jr., chairman.

Committee on Standard Methods for Preparing Tuberculin and Mallein, A. P. Hitchens, chairman.

Committee on Standard Methods for Preparing Diphtheria Antitoxin, P. G. Heineman, chairman.

The following committees were discontinued:

Committee on Standard Methods for Diagnosis and Treatment of Rabies.

Committee on Standard Methods for the Diagnosis of Glanders.

Committee on Standard Methods for the Standardization of Disinfectants.

The present status of the work of the active committees which will be merged into the Standing Committee is as follows:

The most recent findings of the Committees on Bacteriological Examination of Water and Sewage, and the Committee on the Bacteriological Examination of Milk are in print as separates, though the former is in combination with the report of the Committee on Chemical Examination of Water and Sewage, now ready for final revision by the members of the original committee.

The Committee on Shellfish has turned in its report for publication, and the same is true of the Committees on Antimeningococcus Serum and on Diphtheria Antitoxin. There is no material ready for publication from the Committees on Influenza, Tuberculin and Mallein, and the Examination of Air, though progress reports were accepted from these committees at the San Francisco meeting.

The Standing Committee has been called together for a meeting at this time for organization of work for the future, and hopes to have the hearty coöperation of the Section.

ROGER G. PERKINS, M. D.,
Chairman.

OPPORTUNITIES OF VITAL STATISTICIANS

W. A. PLECKER, M. D.
State Registrar, State Department of Health, Richmond, Va.

Read before the Vital Statistics Section, American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 15, 1921.

WHEN a trained physician abandons the agreeable and useful work of the general practitioner to accept the call to become a vital statistician, he is apt at times to wonder whether he has acted wisely, and whether his opportunities for service are greater in his newly-chosen field.

This thought was particularly insistent during the strenuous war and influenza period; and it still persists on account of the growing deficiency in the number of country doctors, created by the high standards and high cost of medical education.

An additional reason for doubting the wisdom of continuing in a work with a fixed, and usually insufficient salary, is the fact that the same energy and qualifications necessary for a successful state registrar would probably bring much better financial returns if properly directed into other channels.

When, in addition, we consider the periodical struggles with legislatures to secure sufficient appropriations to carry on the absolutely essential work in anything like a satisfactory manner, and the disappointed hopes when one sees his visions of life-saving measures vanish into air because legislative committees rate dollars higher than human life and health, then he cannot but doubt whether his time and efforts are worth while.

Add to this the difficulty of securing the passage of the simplest and most obviously essential improvements in your law without hours and days of wasted time and humiliating lobbying, and the picture is made still darker.

Then consider the lost thrill of knowing that you have saved a human life and

the fond memory of close friendships and endearing words of love, or maybe flattery, which grateful patients pour into your ears. For these pleasures you substitute the ill will and cynical letters of physicians and others who, by their own neglect, force you into an attitude of harshness in law enforcement.

What have we to offset this dark side of the picture?

If there was nothing more than the daily grind of routine work—even though we well know that this is fundamental and is the foundation upon which efficient health work rests—we might grow impatient, and even be tempted to return to our old and pleasant field.

This paper is intended to show that it is possible for a state registrar, who is a physician with the life-saving instinct strongly developed and who is associated with a chief who does not hinder or restrain, to make use of numerous opportunities for service, independent of the usual work of collecting and compiling vital statistics, yet based upon the first-hand information thus acquired.

In most states, the money and effort available to the health department is used in controlling typhoid fever, tuberculosis, venereal and other communicable diseases, and in lowering the infant death-rate.

Some phases of health work now being done by various separate bureaus may be more economically and satisfactorily handled in connection with the vital statistics bureau, each branch of work really adding to the ease and efficiency of performing the other.

Other opportunities not yet reached by the main health department may be identified, the situations statistically studied, and the work interwoven and engrafted into others of a similar nature. Such work may be inaugurated and developed as far as it is possible from the vital statistics office, until it can be taken over by special field workers with sufficient means.

Some such collateral work is now being done by the Virginia Bureau of Vital Statistics, while other opportunities have been identified and await development.

While probably no two states have just the same problems and opportunities, it is likely that almost all states having directors in charge trained in medical practice and health work may find openings for additional service beyond the mere clerical work of supervising the collection and compiling of vital statistics.

In organizing the Virginia Bureau, the state registrar introduced a simple method, used with good results by him as county health officer and vital statistician, which enabled him to keep an accurate check upon the number of births reported each month by the individual physicians and midwives.

The physicians and midwives of each county and city are listed upon properly ruled sheets, and each month, in the proper column, the number of births reported by each is checked off from the bound certificates.

The physicians and midwives are each sent an annual letter of encouragement, in which they are told individually the number of births reported by each during the previous year. These sheets are bound into volumes and give a continuous record of the obstetrical work done by the 3,000 doctors and 6,000 midwives of the state for each year. This positive record is put to many uses, such as keeping careless men from being appointed health officers, local registrars, etc.

Two important pieces of work are effectively and accurately done, based upon this system.

One is the enforcement of the law for the prevention of blindness, through the distribution of wax ampules of 1 per cent solution of nitrate of silver, to physicians and midwives, to be used in the eyes of the newborn.

We note over the name of each, the number of ampules sent with date, and notify by form letters any who are found to be reporting births largely in excess of the number of ampules requested. This

enables us to send the correct amount needed, prevents waste, and enables us to keep constantly in their hands a supply of fresh material to last not over six or twelve months.

When the state legislature placed these midwives under the supervision of the state registrar, with autocratic power to grant or refuse them permits to practice, we had the complete machinery already running smoothly for handling the situation.

A permit was prepared, on the back of which was printed a number of inflexible rules for their guidance. These were issued to the midwives by the local registrars. They are signed by state and local registrars, and are the authority by which the midwife may charge a fee for services. With the permit is issued also an illustrated booklet of instructions.

No opportunity is lost of impressing upon them the one rule, that they are never to make a vaginal examination. By this means we believe the puerperal septicemia death-rate has already been materially lowered.

We also reach the physicians, not all of whom are equally aseptic in their methods. We inform them by letter with the same booklet just how we are handling the midwives, and solicit their aid in impressing upon them the instructions we have given. A number of county nurses are now giving midwives systematic instruction under our guidance.

We realize that our teaching of these midwives is quite elementary and their requirements meager in comparison with some other states with different populations and physicians in more adequate numbers.

When it is remembered, however, that our midwives are chiefly uneducated, colored women, the long road to be traveled before they become competent obstetricians, will be appreciated.

While the death-rate from typhoid, tuberculosis and the diseases of infancy and childhood are being constantly and steadily lowered, the pitiable fact remains that in nearly, if not all, of the states of the Union, the puerperal death-rate is from two to four times what it should be if every pregnant woman could receive adequate prenatal and obstetrical care.

In Virginia, and certainly in many of the other Southern and Western states, owing to the scarcity of physicians in the rural sections and their unwillingness in many cases to give up their valuable time without adequate compensation, many women must necessarily be attended by ignorant and dirty midwives.

In order that those who are specially endangered may be warned of the causes and prevention of puerperal accidents and deaths, we have hit upon a plan of systematically teaching the 25,000 newly married couples whose marriages are reported annually to our office.

An illustrated booklet is mailed under first-class postage to these young couples, giving them timely advice on these and other health subjects. In it also, an effort is being made to stop the rapid increase in divorces, reports of which are likewise received and compiled by our Bureau. Warning is also given of the criminality and danger of induced abortion. We estimate that if this plan is systematically continued for ten years, a quarter of a million young couples of child-bearing age will have received at least this much instruction and warning.

This constitutes the most important part of the population, and that which ordinarily would not yet have been included in the mailing list for health literature. The booklet recommends the bulletins on prenatal and infant care of the Children's Bureau, and the various publications of the State Health Department. Many appreciative letters requesting this reading matter are received at our office.

The state registrar is likewise special agent for the distribution of the child and maternal welfare literature of the Childrens' Bureau, and is doing considerable work in thus distributing it where it is needed and wanted.

An effort is now being made, also, to reach the young mothers through the cradle rolls of the various Sunday-schools. The Methodist Church is already coöperating to some extent in this work, and it is hoped that others will likewise call upon us for lectures or literature.

The state registrar lectures at the Medical College of Virginia, the School of Social Workers in Richmond, and has the arrangement of a course of lectures on preventive medicine, first aid, obstetrics and nursing, given by the heads of the State Department of Health to a rapidly growing school of young women who are in training under the auspices of the Presbyterian Church to become missionaries in this and foreign countries.

There is a wide field also for the writing of timely newspaper articles upon general and special subjects, which may be based upon statistical studies and made adaptable to local communities or to the state at large. Newspapers are usually glad to accept such articles if they are properly written, especially when they are of local interest.

For a while our Bureau issued a monthly bulletin containing short discussions of timely topics, giving also a table of birth-and-death-statistics by counties. We are compelled, however, for lack of sufficient appropriation, to discontinue it, but hope that it may be taken up again.

In closing, I will say that this collateral work may be done by any interested registrar of vital statistics with medical or public-health training, and need not interfere in the least with his main work as a vital statistician, that work being done chiefly by others under his guidance.

It is not expected that any other one person will be able to do just this form of work in just this way, but any one may, if he will, discover similar opportunities in fields ordinarily not yet reached by other health workers, and which he may with his statistical knowledge of facts, do, perhaps, better than anyone else, at a minimum of cost.

SUMMARY

State registrars who have been practitioners of medicine and have the life-saving instinct strongly developed, may find opportunity on the side for such effort.

This need not interfere, but may assist in securing and compiling statistics.

1. The law for the prevention of blindness may be most efficiently enforced through the lists of physicians and midwives, and a system of checking off monthly the births reported by each, and holding them up to requesting a similar number of ampules.

2. Effective work may be done toward reducing the maternal and infant death-rate by supervisory and licensing power over midwives, who are taught by booklets and letters and required to obey health rules.

3. County nurses may be encouraged to do follow-up and more intensive work, and be aided through lists and records of midwives, literature and advice.

4. Bureaus recording marriages may instruct newly-wed couples by means of attractive booklets, etc., urging them to ask for fuller prenatal and maternal and child welfare literature.

5. Amongst other means are timely newspaper articles, and lectures to medical and other schools, and the public.

6. The Virginia Bureau of Vital Statistics is demonstrating the possibility of these methods of service.

Health Plays for School Children.—A pamphlet containing 15 health plays, which were developed by teachers and pupils in the public schools of Greater New York, has been printed by the Health Service, New York County Chapter, American Red Cross for Child Health Organization of America. All of the plays are presentations of the value of milk to health. Some are very short, mere tableaux or recitations, others are long and require considerable dramatic ability. The booklet is illustrated with clever sketches.

REPORT OF COMMITTEE ON MORE ACCURATE POPULATION ESTIMATES

Read before the Vital Statistics Section, American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 17, 1921.

IN estimating populations in the intercensus years, it has been the custom of the Census Bureau to add on each year one-tenth of the increment of growth shown during the two previous federal enumerations. This method, known as the arithmetical estimate of growth, is generally satisfactory, but there are instances of unusual growth, due to industrial activity, where the arithmetical method introduces a large error. For instance, Detroit's death-rate, as taken from the mortality statistics for 1917, was 19.0. Actually the figure should have been 14.2. The census estimate of population in 1917 was 589,000. The figure determined by a local estimate was 825,000. As the census figures are regarded as official and are widely used, a grave injustice may thus be done to a city by the publication of erroneous mortality rates.

The committee, since its appointment at the San Francisco meeting, has been in correspondence with the census bureau relative to this matter. The following two propositions were made:

(1) That the Census Bureau on May 1 of each year notify the health commissioner of each city of 100,000 or over, and the health commissioner of each state, of the population it proposes to recognize on July 1, and that if any deviation from this is necessary, the health commissioner should submit facts tending to show what the population figure should be.

(2) That the Census Bureau give due consideration to the information submitted and make such alterations as they deem reasonable, so that the annual mortality statistics and the weekly health index may portray the populations and the mortality rates with the greatest accuracy possible.

These propositions were not accepted, but the geographer of the Census Bureau, Mr. C. S. Sloane, is willing to depart from the arithmetical method in certain instances and proposes the following method of checking populations:

From the total deaths certain causes (1, 4 to 10, 28 to 35, and 155 to 186) are deducted. Using the remaining causes for the last six months of 1919 and the first six months of 1920, and the enumerated population of January 1, 1920, a rate is computed. This rate (which is assumed to be constant) is applied to the remaining deaths of any year, after same causes have been deducted from the total deaths; this gives the new population. An estimate can be made arithmetically by using the above population and the latest census as a base, and then projecting forward for a year or so, but not more.

It is possible that this method will prove satisfactory. However, it will be noted that the deaths from pneumonia are not deducted, so that any calculations based on 1919 and 1920 figures will be in error, owing to the effect of the influenza epidemic. Due to the minor pneumonia disturbances that occur every few years, we question whether pneumonia should properly be included in the so-called static death list.

There still remains the case of the city or state which takes an accurate census of its own accord. Under the present plan this will not be recognized. A city-wide census, conducted by the board of education in May, 1921, shows 942,000 people in Detroit. The estimated population, as published in census reports, is 1,070,000. There is every reason to believe that this census is fully as accurate as the federal census and should be given recognition. Otherwise Detroit's mortality rates will now be too low, whereas prior to January, 1920, they were too high.

It is the recommendation of our committee that the Vital Statistics Section endorse the following resolution to be forwarded to the Bureau of the Census.

RESOLVED, That it is the sentiment of the Vital Statistics Section of the American Public Health Association that the Census Bureau, in making estimates of population in the intercensus years, shall give due consideration to local censuses and shall use the local figures in preference to the arithmetical method of determining annual increase if the local census is taken under the supervision of the Bureau of Census and if they are satisfied with the accuracy of the figures.

GEORGE T. PALMER, D. P. H.
Chairman.
L. E. ROSS
SHELDON L. HOWARD

THE HYGIENE OF CARDIAC CHILDREN

CHARLES HENDEE SMITH, M. D.

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Read before the Child Hygiene Section of the American Public Health Association, at the Fiftieth Annual Meeting, New York City, November 15, 1921.

CAN we lay down any rules of hygiene which are applicable in general to all children with heart disease? Before we can decide this it is necessary to consider briefly several aspects of the cardiac problem. By the studies made in the many cardiac classes established in New York and elsewhere in the last five or six years, we have learned a good deal about the systematic care of the cardiac patient. What I shall say is based upon about five and one-half years' experience in the Huddleston Memorial Cardiac Class at Bellevue Hospital and upon similar work at the Vanderbilt Clinic and elsewhere before this.

The problem is no small one. It concerns us all, for about 2 per cent of the population has some form of heart disease, according to surveys made in schools, industry and the army. Most of this is contracted in childhood, so the problem has largely to do with the child.

It has seemed to me that we can not lay down a régime for any cardiac child without keeping four main principles clearly before our minds.

First. An accurate diagnosis and classification must be made.

Second. The heart itself must be treated when this is necessary.

Third. The child's health and nutrition must never be forgotten.

Fourth. The portals of entry for infection must be removed as far as possible.

1. It is obvious that an accurate diagnosis and classification are necessary to treat any patient intelligently. It is especially important here, because there has been too much loose thinking concerning heart disease. All cardiac children do not need the same advice and care. In the past, more children have been needlessly restricted in their activity than have been harmed by overexertion, chiefly because the discovery of any murmur has been regarded as an equivalent of a sentence to a crippled life, and probably to a short one.

The diagnosis must be made by thorough history and examination. It must include:

An etiological diagnosis, or search for the cause.

An anatomical diagnosis as to the lesion of the valves and heart muscle.

A functional diagnosis, or decision as to the capacity for work of which the heart is capable.

The first of these must be decided largely by the history, which is by no means clear in a great many children. We must inquire most carefully for the diseases which cause endocardial involvement. Sore throats, infections of the

teeth, scarlet fever, diphtheria, etc., are the primary infections resulting in chorea, rheumatism, joint, bone, or muscle pains, torticollis, or the skin conditions which we associate with rheumatism (erythema, nodosim purpura, etc.). Syphilis is a very rare cause of heart disease in children. It is a matter of no small difficulty to elicit a history of these conditions, but perseverance will often bring out facts which the mother has almost forgotten as they seemed to her so insignificant. At times we must confess that it is impossible to obtain any history of antecedent infection.

The valve and muscle lesions, as determined by the size, sounds and murmurs of the heart, are important parts of the diagnosis, but are by no means the whole story. This is the mistake which is most often made. As a matter of fact, the type of lesion makes less difference to the child than some of the other factors.

The functional or hemic murmur must not be forgotten as the one most commonly encountered.

The functional diagnosis can not be made out so easily. A decompensated heart offers us no great difficulty, for the patient's incapacity for exertion tells the story all too plainly. But in children with fair compensation, it is not always possible to say offhand how much exercise should be taken. Certain tests which note the rate of rise and fall of blood pressure after measured exercise with dumb bells and stairs, have been devised by Dr. Barringer and applied to children by Dr. May Wilson and others. These give us perhaps the most scientific measure of the heart's capacity for work. However, the size of the heart, the character of the apex impulse, the quality of its action, and the general behaviour of the child upon exertion will give a fair idea as to what he can and ought to do.

When we have complete diagnoses, we can classify our patients. Cardiac classification is still in process of transition, for none has been found which satisfies us all.

It is agreed that the cardiac problem does not deal alone with organic cases, but must include two other groups. First, potential heart disease includes the children who have suffered some of the infections which commonly affect the heart, especially rheumatism and chorea. Such children must be watched and treated, for it is on them alone that our chief preventive work may be done. Second, possible heart disease includes all the patients with abnormal physical signs—functional murmurs, arythmias, enlargements, etc.—but with no definite or certain heart disease. They need watching, for errors in diagnosis may have been made and organic disease may be present in its early stages without typical signs. The organic group includes congenital and acquired cases. They may be divided into those who have never had symptoms, those who have had symptoms but have recovered, and those who have symptoms at present. The latter may be able to carry on slightly diminished activity, greatly diminished activity or practically none at all. The last means complete decompensation.

It is perfectly obvious that all these groups of patients with heart disease need different advice and, therefore, we must carefully classify each case before laying out rules of conduct.

2. This brings us to the second fundamental point, the care of the heart. The organic heart cases alone need be discussed, for the other groups have no heart lesion of importance. In the children who have never had any symptoms, the heart need be considered very little. With definite organic disease perhaps it is wise to warn them against the most violent exertions, but the heart muscle can be trained up to its handicap better by moderate exercise than by mollycoddling. When there is diminished exercise tolerance, the amount of exertion allowed must be prescribed with care in

each individual case. Some children may play all but running games; others may walk freely, but have to be careful on stairs; others may walk only a very little and can climb no stairs at all. These matters may be judged very largely by the story which the child and parent tell as to his reactions to the different forms of exercise, as well as by the functional test. When decompensation exists or seems imminent, bed care is, of course, necessary at home or in hospital, with stimulation and so forth, where indicated.

We have learned a good deal about the hospital care of the severe cases since this systematic observation has been under way.

In former years and, I fear, in many hospitals to-day, a cardiac patient is admitted, the staff listens to the murmur and makes a diagnosis, and then after the most urgent symptoms have abated the patient is discharged, to go home, often directly back to work or school. The result is that he is back in a few weeks and becomes the notorious cardiac repeater.

We have found it profitable to our hospital service at Bellevue to keep for a long time, for many weeks or often for months, the child with heart disease which needs hospital care. When he has gotten as much out of his hospital stay as possible, we send him to a convalescent home for two or three months more. This single long period of rest is infinitely better than many short ones and saves the hospital expense in the end.

3. It has seemed to me from the start, and more than five years observation of children in a cardiac class have only served to strengthen this feeling, that one of our greatest possibilities of helping the cardiac child lies in the direction of the improvement of his general health and nutrition. Many of these children are undernourished and anemic. Of the organic cases in the class at Bellevue four years ago, 70 per cent were underweight. The habits of life of most of them are characterized by the breaking of almost every law of health. Nearly all are spoiled, for the parents have feared to discipline them lest they "drop dead." If the nutrition of the body and the quality of the blood can be built up in these children, surely the heart muscles should profit with the other tissues. As a matter of fact, it is our experience that if a cardiac child is undernourished, his heart will improve step by step with improvement of his nutrition. Unless the health and nutrition can be improved, it is unusual to see great improvement in the heart. A child's deep-seated impulse to grow and gain will have its way, unless there is some overwhelming cause to prevent it. Therefore, growth and gain are our best measures of health.

How can we improve nutrition? It is here that our rules of hygiene are all important. We must teach the child and parent what is a proper hygienic mode of life. We must lay out a schedule for the day's activities, which prescribes every single thing which the child does during the day. We must order the time of retiring and rising (7 to 7, as a rule). The rest after the midday meal should be kept up whenever possible.

The diet must be prescribed in detail and this should be a good nourishing diet suitable for any child, with plenty of cereals, milk, vegetables, fruit, eggs and some meat. Meat should not be forbidden. It should be taken by all children, not only because it is almost impossible to keep a child from becoming anemic on a meat-free diet, but also because we feel that meat has no relation whatever to rheumatism. The same may be said for "acid fruits" which have been interdicted without any reason in the past.

The bowel function should be regular and always after breakfast, for a delayed action allows absorption. This is one of the essentials to good health.

The question of fresh air at night and by day is important and must be discussed with the parents in full. Bathing

makes for good health and must not be overlooked.

The question of school always comes up and must be settled on its merits in each case. It should not be continued when it is too great a strain on the child's health or heart.

All these directions must be given with great detail and care. Printed directions save much time and effort, since verbal instructions are rarely remembered, and written ones are rarely given by the doctor on account of the time involved. They should be filled in for each individual case, however, or they lose much of their force, and should be gone over carefully with the parent and child to be sure that every point is understood.

The child with heart disease must learn all these rules of health, and must learn to obey them all every day of his life.

4. The commonest portals of entry which are accessible for treatment are the tonsils and teeth. The latter must be put into good condition and, what is more, must be kept so. Decayed teeth should be filled or pulled even if they are only first teeth. It is not desirable to attempt complicated root canal work as a rule, on account of the danger of further absorption from apical infection. The tonsils ought to be removed *in every case,* for they are so much the most common portals that the risk of leaving them in is unjustifiable. The children should be fit to endure the operation, however. Cases which are anywhere near decompensation should not be operated upon. Before operating it is often wise to build up to some extent the health and nutrition of a very badly nourished child, even if the cardiac condition might stand the operation. It must be understood that this excuse should not be used to the detriment of the child in postponing any urgent operation too long. These very thin children often recover very slowly from the effects of tonsillectomy if allowed up too soon. We keep all patients in bed for one week at least after the operation, which lessens the shock and rests the heart as well. The child usually recovers the lost weight very rapidly.

The potential cardiac needs, in general, the same treatment as the organic case, except that exercise short of overfatigue need not be restricted. His health and nutrition are all important. Whenever it is possible, his portals of entry should be removed. There should be continuous observation for the first sign of relapse of the rheumatism or chorea cardiac involvement, and the disease may be arrested if the child is put to bed at once and not allowed to run around with active chorea or advancing heart disease.

The cardiac classes have proved to be a most economic way of caring for large numbers of heart cases. They provide continuous observation and a consistent policy of treatment which is what has been most lacking heretofore. By pooling their experience in the Associated Cardiac Clinics, they are using much the same methods and the standard of care is constantly being raised.

Ten years ago no convalescent home would receive a heart case. To-day there are 8 homes with a capacity of 275 beds available for the care of cardiacs; 900 cases were accommodated in them in the last six months. It was necessary to educate the managers of these institutions, and to demonstrate to them that the danger of having the patients drop dead was a negligible one. Several homes receive only cardiacs, and give them excellent treatment.

The essential thing is that each child ought to be kept a long time, two, three or even six or eight months. Here again one long stay is better than several short ones. The best cases are the undernourished ones who can be built up in health and strength. This type of home can not care for the severe or decompensated cases, as a rule.

The education of cardiacs offers the greatest difficulties, for they miss more time and are more generally retarded in school than any other group of children.

Many special classes have been established in schools and have done admirable work in keeping these children under observation. A large majority of children with organic heart disease can attend the ordinary school classes, because their exercise tolerance is normal. Even when it is somewhat diminished, by taking time on stairs, a good many children get along perfectly well.

The convalescent homes need to consider education also, and school classes are held in many of them, and instructions given in needlework, knitting, etc.

Vocational training is a branch of cardiac care which we have barely touched. A great deal has been done by the Bureau for the Employment of the Handicapped, but there is much still to be done. We need many trade schools which will teach sedentary occupations to the adolescent cardiacs, so that they may be easily kept out of heavy work. There are many such occupations, e. g., watchmaking, engraving, bookkeeping in the skilled group; the lighter trades in the less skilled, and timekeeping or similar work for the less intelligent.

Our present plan is a great step forward. The classes are caring for the ambulant cases as never before. The hospitals and convalescent homes are handling their part better, though there is still room for improvement.

The hopelessly crippled child still needs one more type of care—that which he would receive in a chronic cardiac home. These poor children can not be kept in hospitals indefinitely and yet they need continuous hospital care. There is no greater opportunity for charity than in the establishment of a refuge for these severe advanced cases, where they may be kept happy and comfortable, and taught some interesting occupation for the time they have to live.

What are the results of systematic care of children with heart disease? They are hard to estimate accurately, yet they have been unexpectedly good. The prognosis of heart disease is certainly better under this type of care than under the old expectant method, sitting with folded hands, waiting for reinfections and repeated fresh heart involvement. St. Lawrence's statistics on the incidence of rheumatic infection before and after tonsillectomy have demonstrated by actual figures that this operation markedly diminishes the likelihood of recurrences. So we can do much preventive work both on the potential and organic cases. By building up the health, strength, and nutrition we increase resistance to infection and give better nutrition to the heart muscle as well. By continuous observation and watchful care of the heart, we save attacks of heart failure.

A great many of these children are doing unbelievably well in the cardiac classes. Many are getting well, as far as function is concerned. It may be that time will show us that heart disease, when given proper care, is not so serious a matter after all.

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PRACTICAL MEANS OF REDUCING MATERNAL MORTALITY

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Presented before the Child Hygiene Section of the American Public Health Association at the Fiftieth Annual Meeting, New York City, November 17, 1921.

NO discussion of this important and interesting question can be of social or scientific value unless the morbidity and mortality of both mother and child are grouped together; for such a union is inevitable in every attempt to develop constructive measures. The title of the paper, however, limits my remarks to the mother alone. In considering the mortality-morbidity rate of the mother it

is difficult accurately to gauge either the number of deaths indirectly due to childbearing or the amount of invalidism, whether partial or complete, resulting therefrom. The wider my experience, the greater my conviction, that in both instances the toll is very high.

Child bearing *is* a natural function of the body, but this does not imply that it is necessarily a normal one! Actual facts point to quite a different conclusion. Robust health is unfortunately no bar to the complications of pregnancy. A severe indictment it is, of the public conscience, that as many women die to-day in the United States from parturition as died fifteen to twenty years ago. In fact, recent statistics point apparently to an actual increase of the death-rate; this, too, despite the fact that deaths from almost every other surgical or medical condition have decreased. The real explanation rests upon public and private ignorance as to the perils of this so-called natural process and to the difficulties of changing this ingrown belief. It is true that in certain favored communities very definite and striking improvement is taking place, but I am speaking of the country as a whole.

Twenty or more thousand women are practically certain to lose their lives this year from causes incident to motherhood, and yet we are confident that at least one-half of these lives could be saved with reasonable prenatal and natal care. The evil effects of parturition upon virtually all subacute or chronic medical conditions cannot be overestimated. This is most marked in the presence of tuberculosis, renal affections, high blood pressure cases, heart conditions, psychoses and the generally subnormal, highly civilized women of certain groups of society. Gynecological surgery is intimately concerned with cases of obstetric trauma in some form. Tubal infections, moreover, will not infrequently spring up or spread as a result of an abortion, or of childbirth, despite the best of care. Further, much invalidism is the direct result of either spontaneous or criminal abortions, which occur with unbelievable frequency. The great majority of women receive little or no supervision at such times and in consequence develop either severe sepsis or a mild form with resultant menstrual disturbances lasting often for months at a time.

I believe I am correct in stating that the greater the experience and the closer the relationship of the internist to medical conditions accompanying pregnancy or arising in its course, the greater will be his belief in the damaging effect of pregnancy on the conditions I have just cited.

Such, in brief survey, is the condition confronting us. The picture seems a trifle gloomy. I have no desire to have the dark side overdrawn. Propagandists and theorists may at times overstate the case in their zeal; but we have now sufficient accurate data to warrant greater effort along constructive lines.

Fortunate it is for our great army of mothers and would-be mothers that each of the past five or six years has shown an ever-widening interest in their welfare. The awakening in this regard has been quite startling and certainly most gratifying, but so far the movement has been of rather limited scope. How are conditions to be improved?

The answer can be given in a few words, but the accomplishment can be obtained only after constant and serious endeavor.

Improvement will take place, first, by raising the standards of medical teaching in obstetrics as well as in the state requirements for the practice thereof; second, by stricter regulation of midwives and their elimination when possible; and, third, by widespread education of the public in the essentials of maternity protection.

I. IMPROVEMENT IN MEDICAL TEACHING

Medical school authorities, except to a limited degree, fail to realize the real relationship of obstetrics to the com-

munity. The necessity of thorough clinical work in this line is not as yet sufficiently appreciated. State requirements have been far too lax. As a result, the student is usually given the minimum amount of practical work and a minimum amount of time in either hospital wards or dispensary. Theoretical teaching on the whole is fairly good; but less and less of this should be given in the classroom and more and more in the clinic. It is gratifying, however, to learn that at present an increasing number of states are adopting for registration purposes the standards presented by the Standardization Committee of the American Medical Association (i. e., each student must have witnessed at least twelve confinements and must have had entire charge of at least three of these). The three great fundamentals the student should learn are (a) thorough familiarity with the normal, whether during pregnancy or labor; (b) recognition of the fact that foresight or prevention is absolutely essential to success; that prenatal care, properly given, will win more than one-half of the battles, and that strict asepsis is fully as essential as in general surgical practice; and (c) recognition of his own status, that is, that he is not a specialist on graduation; that meddlesome midwifery accounts for many deaths, many needless complications and much invalidism.

Merely because childbearing happens to be natural to womenkind, it is taken for granted that any doctor or any average midwife is competent to see these patients through the most trying experience of their lives. As I have remarked before, why, if it is deemed wise by the American College of Surgeons to require special training in surgery before a man is judged capable of practicing surgery, is it not just as important that anyone attempting to care for other than normal deliveries, should likewise be required to have special training?

The physician must ever remember that there are two lives at stake; that he is responsible for the life and the near future of both. Too much attention is given to striking operations, too little to the every-day essentials. There seems to be a setting aside of essential truths proved through years to be of inestimable value, and the tendency to resort to surgery on slight provocation. The great majority of babies can still be born *per vias naturales*. Cæsarian section, difficult versions, and forceps operations are for the specialist, and are, in the long run, necessarily hazardous in the hands of the partially trained. Though speaking so positively, I am yet familiar with the fact that real specialists are far too few in number and that the family physician, particularly in rural sections, is thrown on his own resources and usually labors under most trying conditions.

II. THE MIDWIFE

Lack of coöperation on the part of the midwives is a difficult problem in prenatal work, and yet it is most important to secure their confidence. They are naturally suspicious of the nurses, and for the most part are convinced that both the clinics and the nurses are scheming to take away their patients. As a matter of fact, this is far from being the case; at least, in New York City. These midwife cases are the very ones that should be reached by educational methods, for with but few exceptions, they receive no over sight during pregnancy. Greater care should be exercised by the authorities in the granting of licenses. The surest way to eliminate the midwife, if such elimination is desirable, is by continually raising the standards demanded of her. In time, perhaps, she may be totally eliminated, but to attempt to bring this about at the present time, particularly in crowded foreign areas, would accomplish but little good and would unquestionably greatly increase the discomforts and sufferings of the poor women amongst whom they practice. We probably all be-

lieve in the need of the strictest sort of supervision and in her gradual elimination, but as we restrict her practice, so much the more are we obliged to give the poor parturient woman something better in her stead. I feel quite confident myself that in large foreign communities, at least, the only ways in which these midwife patients can be cared for, if the midwives are eliminated, are (a) by increasing the outdoor services of obstetrical hospitals; (b) by giving certain nurses special training in handling normal labors, and (c) by developing voluntary community health protection.

III. EDUCATION OF THE PUBLIC

Turning from the consideration of medical teaching in obstetrics and from the midwife, the great approach to the public will be along the lines of achievement through prenatal care. When the public, far and wide, once appreciates from reliable statistics the real issues and learns what in general can be accomplished by proper, or at least by *some* supervision, of the expectant mother, it will in time demand both improvement in the supervision of pregnancy and better standards during childbirth.

To reduce maternal mortality and morbidity, the public must be reached and not one, but many, lines of approach will have to be followed in order to change the general viewpoint.

In developing work of this character in any community, bear in mind that the saving of lives and the lessening of morbidity are primarily medical in their nature and, therefore, every organization attempting it should have the strongest kind of medical support. The work will at times be initiated by the physician, but more often by others. This does not minimize the obligation of the profession to the general welfare of the community. The nurse, in all prenatal work, is the greatest blessing money can bring to the expectant mother, but I stand strongly on the ground that it is the doctor, in consultation with the nurse, who should determine what is best for the patient. There is a tendency in these days, partly, to be sure, because of the lack of constructive ideas in public-health matters on the part of physicians, for certain nursing groups or for welfare organizations to enter the socio-medical field with far too little medical advice.

The essentials of prenatal care are these:

First, to encourage all pregnant women to seek the advice of a competent physician as early in pregnancy as possible. This step is a difficult matter to bring about because of the prevailing ignorance on the subject. It is a measure considered of doubtful value by some physicians, but one of the highest value, on the contrary, by those who have made a special study of early pregnancy.

The advantages of this are, namely:

1. The examination itself is of the greatest importance, for from it one learns of the presence or absence of any abnormal condition.

2. The advice a patient will obtain as to diet, habits, etc., is invaluable.

3. She should receive illumination regarding some of the essential phenomena of pregnancy, so that mystery, if possible, may be eliminated.

Second, to have one or more public-health nurses of special training, working in conjunction with a hospital or with outside physicians. It is the nurse who follows up the patient in the home, who advises with her and gets her confidence. Roughly speaking, each patient should be seen twice monthly by either doctor or nurse, depending on circumstances, up to the beginning or end of the seventh calendar month; then once a week. At each visit the general condition of the patient is studied; special symptoms are looked for such as headache, edema, breathlessness, staining, conditions of the intestinal tract. The approximate size of the child is determined and the fetal heart rate taken. The urine is examined for albumin in particular, and the blood pres-

sure taken. The nurse is taught to carry out this routine exceedingly well. Were this not so, our prenatal nurses would not detect as many abnormalities as they do.

Third, where a family is in want or at least in need of some help, a trained social worker will prove an invaluable coöperator. In illness of the mother, some one must relieve her of her burden in the home.

Fourth, all abnormal cases demand hospital care where such is available. Maternity hospitals or general hospitals devoting a certain number of beds to maternity cases are, alas, far too few. Even in our large cities results would be better, could more cases of difficult labor be sent to them. In country districts this question is particularly vital and unsatisfactory because of great distances and because of the fact that, out of the three thousand or more counties in the forty-eight states, more than half have no hospitals of any kind. With such a serious situation, coupled with the decrease in the number of rural physicians, it is obvious that upon the public-health nurse will fall the chief burden of teaching and watching over the expectant mother. The largest item in the expense of this work, either in the city or in the country, goes to the payment of the salaries of these public-health nurses. I am here reminded of the words of Miss Fox of the Red Cross, "Whenever there is a public-health nurse provided and her presence in a town or in the county becomes known, she is immediately surrounded by the women of that territory begging her to come to their homes and help them with their problems. The nurses will tell you they are distressed beyond measure because there are so few of them and they have such large territories to cover that they cannot possibly at present respond to the demands upon them."

We probably differ as to the means of carrying on and developing this work. Each community calls for special consideration, but I, for one, believe that wherever hospitals are available, provided the directors can furnish the necessary funds, this work should be begun by them. They are the logical ones to do it. Where there are no available hospitals or where the funds are lacking, the work can be initiated by some social welfare body. The work can be begun by one doctor and one nurse. Individual boards of health have, it seems, the right and the duty to educate the people in the needs of prenatal care. They can require definite standards both from doctors and midwives. Teaching in prenatal care should be a definite part of the work of the public-health nurse. I see no reason why the state should not engage in all forms of preventive teaching. *I am not implying treatment on its part.* A wonderful opportunity presents itself, particularly in rural sections, for such teaching!

There are to-day groups of persons—some highly trained—whose opinion calls for respect; there are others who are merely opportunists, who decry as paternalism all forms of state or national aid in matters pertaining to the welfare of mothers and young infants. These persons do not decry state or federal aid to education; in fact, they demand it. The farmer expects and receives assistance from the Department of Agriculture; the manufacturer does not call it paternalism if the government lends his particular industry support through a high protective tariff. All we are asking at present is educational help along the lines we are discussing, together with preventative nursing care by the several departments of health nurses. Why this is paternalism I do not see. Motherhood demands our attention. So far we have given a bare minimum. By all means, let the socially minded among physicians take the lead if they will; or, if they cannot, then encourage welfare agencies and as many as possible of them to undertake this noble work, but if the public still remains in ignorance of the life-saving and life-giv-

ing measures we advocate, then I, for one, believe in appealing for federal and state assistance. Do not misunderstand me when I mention the latter, for I know full well the dangers connected with such a course. You will note that I suggest federal or state help only when other methods have failed.

In closing, may I emphasize the two fundamental problems which we hope to study during the coming year and which, after all, are essential to the proper understanding of this whole question.

These problems are:

1. What is the irreducible minimum of prenatal supervision consistent with the results we wish to attain?

2. What relationship does the economic status of the family bear to this irreducible minimum?

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PROPER SIZE OF SAND FOR RAPID SAND FILTERS

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Read before the Sanitary Engineering Section, Fiftieth Annual Meeting, American Public Health Association, New York City, November 17, 1921.

THE question of proper size of sand for rapid sand filters has been a debated one from the time when filters of this type were first used for the purification of public water supplies. There still exist differences of opinion among engineers and others engaged in filter plant design, construction and operation. Originally the use of rather coarse sand was general, but in recent years there has been a tendency toward the use of finer material. However, coarse sand is still frequently specified by engineers and others who thus far have failed to recognize its inferiority to fine sand as a filtering medium.

In discussing this question I shall state briefly the conclusions reached from experience with Ohio filtration plants during the past five years. There has been afforded an excellent opportunity to observe the effect of size of sand upon plant operation and efficiencies, by the existence of fifty-four plants varying greatly in size and handling raw waters of wide variety. The State Department of Health has exerted general supervision of the operation of these plants, receiving reports of daily records of operation made by the engineer or superintendent in charge of each plant. The value of these reports has been enhanced, due to the fact that the larger plants of the state are under the constant supervision of men of technical training and experience. Fifteen men of this type are employed throughout the state and each of them may be said to be an expert in this field. This system of plant operation with general supervision by the state has resulted in producing better public water supplies and has revealed facts which have permitted conclusions to be reached regarding plant design and operating procedures and results. The following general conclusions have been drawn:

1. The final product of a filtration plant after disinfection of the filtered water should show absence of gas formation in ten cubic centimeter samples incubated 24 hours at 37 degrees in lactose broth.

2. The plant as a whole should be designed and constructed so as to permit it to produce a final product as above defined, when the worst condition of raw water prevails, without introducing serious operating difficulties.

3. The plant should be operated so that each part of the purification process will produce its proper share of efficiency with due regard to avoidance of overloading any particular process. Disinfection, in connection with filtration, should be applied to the filtered water as

a factor of safety only and should not be depended upon as a major process of purification of the water.

The adopted standard of quality for the final product of a filtration plant is a very strict one and, as disinfection is recognized only as a factor of safety, the production of water meeting this standard requires excellent design and operation with proper control and maintenance of the plant. The application of this standard does not mean that gas formation is always absent in ten cubic centimeter samples, as occasional positive presumptive results, perhaps in five per cent of samples tested, are almost inevitable. However, the effort is directed at minimizing the number of positive tests. This result, with the disinfection treatment at a low rate as a safety factor, obviously requires that the filtered water before disinfection shall be of a high degree of purity. The approximate standard set for the filtered water is that not more than twenty per cent of ten c. c. samples during the month shall show gas formation. This result is to be obtained by sedimentation, coagulation, softening, and filtration, according to the development of the plant, and not by disinfection, except perhaps in the case of a softening plant where the excess lime treatment is employed. With the problem of producing such high efficiency not only under average conditions but also when the raw water is in its worst condition it seems evident that each process of the plant must be equipped, maintained and operated in the best possible manner to enable it to perform its part of the work.

A study of the efficiencies of Ohio plants revealed important facts regarding the effect of size of sand. It was found that those plants having coarse filter sand (effective size approximately .6 mm. or more) were not producing satisfactory efficiencies with regularity and that a considerable dependence upon disinfection was necessary to produce a final product of bacterial purity. It was also found that plants having fine filter sand (effective size approximately .45 mm. or less) were producing, with regularity and without difficulty, a filtered water of high degree of purity permitting disinfection to be applied as a factor of safety only. Furthermore, a study of the plants of each class showed that no important differences existed in kind of raw water, plant design, method and control of operation or other features except the sand used as a filtering medium. The following are examples of plants equipped with coarse sand which failed to produce satisfactory filter efficiency:

City	Population	Source of Supply	Date Installed	Sand E. S.	Sand U. C.	Analytical Control
Alliance	22,000	Mahoning River	1913	.63	1.22	Constant
Cambridge	13,000	Wills Creek	1917	.67	1.13	Constant
Cleveland	800,000	Lake Erie	1917	.61*	1.27	Constant
Portsmouth	33,000	Ohio River	1914	.59	1.49	Constant

*The sand at Cleveland was .55 mm. when installed and increased in size due to incrustation.

The following are examples of plants equipped with fine sand which produced a satisfactory filter efficiency:

City	Population	Source of Supply	Date Installed	Sand E. S.	Sand U. C.	Analytical Control
Akron	200,000	Cuyahoga River	1915 & 1919	.39	1.58	Constant
Cincinnati	400,000	Ohio River	1907	.39	1.21	Constant
Sandusky	23,000	Lake Erie (Sandusky Bay)	1909 & 1914	.43	1.35	Constant
Warren	27,000	Mahoning River	1917 & 1921	.37	1.24	Constant

A study of the filter efficiencies for 1920 and 1921 of three plants having coarse sand reveals an average bacterial removal (20° counts) by the filters of 65 per cent, while the average bacterial removal for filters equipped with fine sand in three other plants was 90 per cent. These figures may not measure accurately the value of the filters in removal of gas-forming organisms but the rela-

tion of coarse and fine sand in this respect is probably indicated.

It appears probable that the inefficiency of coarse sand is explained by the theory of the manner in which filter efficiency occurs. This theory is that the sand is in reality a supporting medium for the film which forms at the sand surface and that this film itself is the filter which entangles and holds the bacteria. This film may penetrate the sand to some extent but in general is held at or near the sand surface. The coarser the sand the larger will be the interstices, and the more difficult will be the proper support of the film. It seems reasonable to suppose that with coarse sands numerous breaks of the film occur, particularly when a high loss of head is built up. Most of these breaks may not be sufficient to show indication on a loss of head gage but probably do affect the bacterial removal produced by the filter. If this is the case the use of a fine sand appears to be the reasonable solution.

When the results of the study of filter plant efficiencies were available, indicating the undesirability of coarse sand, it appeared logical to conclude that all new filters should be equipped with a rather fine sand, and that existing filters should be overhauled and fine sand used to replace coarse. The following tentative specifications for size of sand were adopted: "The sand shall have an effective size between the limits .35 mm. and .42 mm. and a uniformity coefficient not greater than 1.8. Preference will be given to a sand having an effective size of .37 mm. and a uniformity coefficient not exceeding 1.6, all particles of which are finer than 1 mm."

It is important to recognize also the probability that sand of satisfactory size when placed may become incrusted and thus become much coarser, if lime is used in the treatment of the water. In such cases it is necessary to watch the sand carefully and to take proper steps to remove the incrustation or replace the sand when necessary. It is likewise important to keep a close observation upon the condition and size of the sand regardless of the chemical treatment of the water used, and it may be found desirable to re-sand filters at intervals to maintain proper sand condition.

All new plants constructed in Ohio during the past two years have used sand in accordance with the above specifications, and a number of the existing plants originally equipped with coarse sand have substituted fine sand in the filters. The results in each instance have been satisfactory. The bacterial efficiencies of the filters have been high, and no serious difficulties in any of the plants so equipped have been encountered in producing the desired results.

Various objections to the use of fine sand in rapid sand filters have been raised. It has been claimed that sand such as specified will cause rapid surface clogging, increase the loss of head, shorten the filter run and increase the percentage of wash water. Another claim is that an excessive loss of sand will occur through the underdrainage or strainer system and by being carried out with the wash water. A third objection raised is the added cost for sand if the limitations as to size and uniformity are rigid. Judging from the experience in Ohio none of these objections appear to be well founded.

The use of wash water at the Cleveland and Cincinnati plants for 1920 was identical, being 1.4 per cent in each case. Cleveland has coarse sand and Cincinnati fine. The Ironton plant (4 M. G. D. capacity) with .41 sand used 2.0 per cent wash water during 1920. The Portsmouth plant (8 M. G. D. capacity) with .43 sand used 1.7 per cent wash water in 1920.

As regards loss of sand, the plants at Cincinnati, Ironton, Akron and Warren having sands varying from .37 to .41 and each employing high rate wash, have not experienced loss of sand by carriage into the wash water troughs. Experience with these plants also demonstrates that the

passage of sand into the underdrainage system is readily prevented by providing properly graded gravel layers and by placing a suitable intermediate layer of coarse (torpedo) sand between the filtering medium and the gravel.

The experience with the plants at Cincinnati and Ironton are of particular interest. The Cincinnati plant, installed in 1907, treats Ohio River water and comprises primary sedimentation basins, coagulation basins with iron and lime treatment, rapid sand filters and chlorine disinfection treatment. The filters were designed for high rate wash and in constructing them care was taken to provide a proper underdrain system and a well graded gravel to support the sand. The sand as originally placed had an effective size of .33 mm. In July, 1920, after thirteen years' operation, examination of the sand showed an effective size of .39 mm. and a uniformity coefficient of 1.21. It was also found that the lime incrustation of the sand was 21 per cent, accounting for the increase in the size of the sand. Observations of the elevation of the sand surface showed that no loss of sand had occurred. Throughout the period of its use the efficiency of the plant has been very high. This is also true of the filter efficiency, and as a consequence the filtered water has been of such good quality that disinfection has been used as a factor of safety only.

The Ironton plant, installed in 1919, also treats Ohio River water. The plant comprises primary and secondary basins furnishing ten hours retention, rapid sand filters and chlorine disinfection equipment. Alum is used as a coagulant, supplemented at times by lime. The filters were designed for high rate wash and are equipped with Wheeler bottoms and well graded gravel to support the sand. The sand as originally placed had an effective size of .39 mm. and a uniformity coefficient of 1.51. A sample of the sand taken from the filters in July, 1920, after seven months' operation, showed an effective size of .41 mm. and a uniformity coefficient of 1.32. Another sample taken from the filters in October, 1921, showed the sand to have an effective size of .44 mm. and a uniformity coefficient of 1.32. Unfortunately no determinations were made to ascertain the extent to which lime incrustation of the sand had occurred. These results indicate that a slight increase in the size of the sand had occurred during approximately two years' operation. This may have been due to incrustation or to the loss of the finest sand grains. No noticeable loss of sand has occurred as measurements made at various times have shown that the sand surface is at the same elevation as it was when the sand was originally placed. During the two years of operation the filters have produced a satisfactory efficiency and no difficulty has been encountered in producing filtered water of quality to permit the use of disinfection as a factor of safety only.

As regards the increased cost resulting from the use of sand meeting the specifications suggested in this discussion, it must be admitted that the cost will be greater when rigid specifications for sand are adhered to. However, in any event the sand cost is an insignificant item in relation to the total cost of the plant, and if, as appears evident, there is an important advantage to be gained by using the more costly sand, this objection fails. For instance, it may be admitted that an undesirable sand may be placed in the filters at a cost of five dollars per ton and that sand meeting rigid specifications will cost ten dollars per ton placed. For a filter capacity of one million gallons per 24 hours the costs would be $225.00 and $450.00 respectively. Either figure apparently represents a low percentage of the cost of the plant or even the filters themselves. Therefore, cost considerations should not interfere with the use of the best sand available.

DISCUSSION

It gave me pleasure to learn that Mr. Dittoe had undertaken the preparation of a paper on the proper size and grading of sands for filter plants. Consulting engineers rarely have an opportunity to follow up the operation of any plant for more than a year, whereas the State Board of Health, charged with the duty of general oversight of all filter plants, has them under constant observation and has a much better chance to observe not only the initial result, but also the continuing behavior during a period of years.

Mr. Dittoe presents data in substantiation of his requirement of an effective size around 0.37. He also disposes of the oft-repeated objections to small-sized sand that it washes away too quickly. The records of 8 plants out of 54 are cited to prove this contention. In this connection it is of interest to note that at Warren, Ohio, where I have just completed work on a six-million-gallon extension to a two-million-gallon plan, three cubic yards of sand passed through the strainer system were found in the settling basins after two years' operation of four 500,000-gallon units, run at times at over double their rate capacity.

I presume that sufficient care has been taken in determining the quantity of wash water used in the majority of cases. At Warren this determination during the past few years has been a mere approximation.

In selecting the sizes of sand at Warren I acquiesced in the desire of the State Board of Health, not only as to the effective size and uniformity coefficient (which are covered by the tentative specifications), but even to the extent of procuring the sand from the particular plant indicated by the Board.

This brings up the moot question as to why the state, in drawing up requirements for the most important element of the plant, should not assume responsibility for the working of the plant, rather than pass along to the engineer and manufacturer of filtering equipment the burden of guaranteeing the overall efficiency of the plant. Where the engineer is held responsible by the city, and the commercial organizations are required to guarantee the overall efficiency of the plant, the extent to which they should be dictated to as to the exact character of the filter medium used, is open to debate.

In complying with the wishes of the State Board of Health, the contractor was obliged to ship in sand for which the cost was $8.00 per ton, whereas he could have procured at about half the price other sand which has in the past given satisfaction as a filtering medium. The analyses of 8 carloads of Ottawa filtration sand (which cost $8.20 per ton, f. o. b. Warren) by the State Board, and checked in the field showed the following:

	Effective size, mm.	*Uniformity coefficient*
Two cars	0.39	1.43
"	0.41	1.39
"	0.39	1.43
"	0.40	1.40
Extra order	0.39	1.44
"	0.40	1.43

Three carloads of regular run, Ottawa sand, which cost $5.70 f. o. b. Warren, tested as follows:

Effective size	*Uniformity coefficient*
0.22	——
0.17	2.12
0.19	2.10

Based upon former analyses, the State Board requested the contractor to use two-thirds filtration sand, and one-third regular run. The sand actually delivered and mixed according to these proportions tested unsatisfactorily, being considered too fine.

Effective size	*Uniformity coefficient*
0.323	1.64

(21 per cent of this mix was finer than 0.4 mm.)

When it became evident that the Ottawa product was not running true to former tests, two additional cars of coarse sand were brought in, and the fine sand in excess was sold to a local dealer

by the contractor for common sand price. A mixture of seven-eighths filtration sand and one-eighth regular run was then tried which analyzed—

Effective size	*Uniformity coefficient*
0.369	1.51

After scraping and washing, a sample taken through the entire bed tested as follows:

Effective size	*Uniformity coefficient*
0.365	1.52

(13 per cent of this was finer than 0.4 mm. Specific gravity—2.67.)

Therefore, at considerable unlooked-for expense and delay, the State Board specifications for size of sand were met.

It seems unfair to put this cost of rejected sand onto the contractor. Beside the expense, a delay of a month or six weeks in the completion of the plant occurred for what is considered by many as unnecessary refinement. Is it really so? If the operating results in the 54 plants under Mr. Dittoe's observation bear out the conclusions based on the 8 plants as tabulated in the paper, there should be no hesitancy on the part of the engineer to purchase the more expensive sand. As Mr. Dittoe explains, the difference in cost of the sands forms a relatively small part of the total cost of the filtration plant. But if the results do not justify the increase in cost and delay, why spend the money? I await with interest data on other Ohio plants.

Bearing out the contention that the limits of the effective size are too narrow, Mr. Dittoe points out that in two years the effective size of the Ironton filter sand, due to lime accretions or otherwise, rose from .39 to .44, which latter figure is greater than the .42 maximum effective size called for in his sand specifications.

Is the efficiency of the Ironton plant falling off? If not, why maintain so narrow limits in the effective size of the sand?

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BOTULISM FROM THE REGULATORY VIEWPOINT

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Mycologist, Bureau of Chemistry, Washington

Read before the Joint Session of the Food and Drugs, Public Health Administration, and Laboratory Sections of the American Public Health Association, Fiftieth Annual Meeting, New York City, November 17, 1921.

THIS is not the place to go into details of the bacteriology of *Bacillus botulinus* and the clinical manifestations of botulism as a pathologic entity. Such data may be readily obtained from numerous recent papers on the subject.[1] On the other hand, every health officer and every food official is confronted with the possibility that the next outbreak of this kind may occur in his own territory. There is good ground for believing the organism of this disease to be very widely distributed. The occurrence of cases is, therefore, not so much dependent upon the presence of the organism, necessary as that is, as upon the presence of the conditions essential to its development.

Two lines of inquiry are, therefore, clearly indicated: (1) What precautions will reduce such cases to a minimum or entirely prevent them and, (2) What action to limit the number of cases shall follow the first evidence of an outbreak?

PREVENTION

In spite of the publicity that has been given to this subject in the last few years, the constant recurrence of cases or groups of cases of botulism shows that many people have entirely failed to understand its real dangers or the means that may be taken to avoid it. Without forgetting the remote possibility of an occasional infection,[2] botulism may be characterized as a food toxemia. The organism must first develop in the food and produce the

poison, then the food must be eaten or there is no disease. Proper advice upon the care and inspection of food products is fundamental in preventing botulism. There is great need, therefore, that every food or health official should not only be familiar with the essential precautions himself, but that he should bring them effectively to the attention of the whole public for whose safety he is responsible. The campaign of prevention should be carried to the packer, the dealer and the final purchaser of food products. Each has a share in the responsibility for such poisoning and each should understand clearly certain characteristics of the causal organism. The packer must use the best known method in putting up food, the dealer must give it intelligent care and scrutiny, but the one who prepares it for the table is the final protector of the life of the consumer.

From this point of view the following characters common to the group of strains included in our conception of *Bacillus botulinus* (*Clostridium botulinum*) are significant.

1. The spores of some of these strains are sufficiently resistant to survive heating processes ordinarily used in cooking.

2. The toxin is readily destroyed by heat. The temperature required varies considerably with the strain of *B. botulinus* used, but in every experiment reported, all trace of toxicity had disappeared in products actually heated throughout to 85 degrees C. for a very few minutes.

3. Anaërobiosis limits the development of the surviving spores to those (a) deep within the mass of food, for example, sausage, (b) enclosed in favorable containers, as well packed canned products, or (c) to those so associated symbiotically with aërobic organisms as to secure the necessary conditions for growth.

4. *Bacillus botulinus* is rarely encountered in pure culture, even in canned food. Other and more resistant anaërobic spore-formers practically always accompany it.[3]

5. The development of toxicity in both pure and mixed cultures is generally associated with commonly recognized signs of spoilage—turbidity of liquor, gas formation, abnormal odor which is usually offensive, or all three of these, and in very many cases pronounced disintegration. The progressive nature of the development of toxin and of the concomitant signs of spoilage necessitate recognition of the possibility that a product may occasionally reach the dangerous stage before the signs of spoilage are readily recognizable.

Brief discussion of these points is desirable:

1. Heat resistance. The recent work of Weiss[4] upon a series of strains of the organism and with an extensive series of food products confirms the work of many others, strain by strain, in showing that under uniform conditions there is much variation in resistance to heat among these organisms. There is even greater variation, due to the nature and especially to the hydrogen-ion concentration of the substratum used. Those products which are neutral in reaction or nearly so are exceedingly difficult to sterilize, whereas the more acid foods are rarely found to contain living spores of *Bacillus botulinus* after cooking in the ordinary way.

2. Of equal importance is the easy destruction of the toxin by heat. Such heating, while not requiring the actual attainment of the boiling point, nevertheless must closely approach that figure to be safe. Cases are on record in which material was assumed to have been heated and yet proved toxic. To be safe, a heating process must raise the temperature of the entire mass to the required figure before all of the toxin in the product is destroyed. It has been shown that 85 degrees C. for 5 minutes is adequate, but the presence of toxin to the very center of masses of food makes it clearly necessary that heat of the required degree should actually penetrate the food before

the danger is eliminated. Merely warming is not sufficient.

3. Anaërobiosis. Although some other species are less tolerant of free oxygen, the organism of botulism is sufficiently sensitive to this element to restrict its development in nature to situations essentially anaërobic. Our human poisoning cases in America have been traced mostly to canned food in which a moderately complete exclusion of oxygen is attained. European cases, on the other hand, have been largely attributed to sausage, which offers finely cut and closely packed flesh with anaërobic possibilities in the mass itself, supplemented by tremendously rapid activity of both aërobic and anaërobic bacteria, as has been shown by Weinzirl[5] and by LeFevre.[6] The demands of anaërobiosis are equally well satisfied by properly packed and exhausted cans of food, by the standard anaërobic technique of the laboratory and by symbiotic relations with aërobic organisms, including bacteria, yeasts and molds as has been repeatedly shown by various investigators.

4. The practical importance of the constant association of other species with the botulism organism is very great. Reddish and Rettger[7] restudied a series of cultures isolated from poisoning cases by different laboratories. In practically every culture, careful examination showed some strain of the *B. sporogenes* group to be present as a contaminant. Extensive studies of spoiled cans of food from batches actually responsible for poisoning have shown many more containers in every series to contain the *B. sporogenes* type of organism than the toxin-producing species. Comparative studies of heat resistance clearly indicate that *B. sporogenes* survives higher temperatures and more prolonged heating than *B. botulinus*. Many individual containers of the batches of canned food incriminated have been studied by us. Dangerous cans of food have been found not as isolated spoiled cans in sound series, but as few or occasional toxic samples among many spoiled samples found in the batch. These observations covering the past three years have forced us to the conclusion that any lot of canned food showing appreciable percentage of spoilage is potentially dangerous. Extensive spoilage is clear evidence of radical failure in sterilization. Batches showing this condition should be withdrawn from the market, carefully sorted and that portion apparently sound should be thoroughly reprocessed before distribution.

5. The association of physical signs of spoilage with toxicity can be easily overemphasized, but scrupulous examination of many series of samples in the toxic condition shows that evidence of spoilage is rarely, if ever, absent in the dangerous sample. Cooking all canned food before consumption is an adequate precaution and should be resorted to in cases of doubt or of ignorance of normal characteristics. In series of commercial canned products examined in the Microbiological Laboratory in which the analyst was already familiar with the product, samples selected as sound and in wholesome condition have never proved toxic in feeding experiments and have never shown evidence of bacterial activity when tested by culture. Physical evidence of spoilage has, on the other hand, been consistently supported by bacteriological examination. Among spoiled products no one of us who has actually handled the material dares pretend to say which of many spoiled products will prove toxic. The typical "botulinus odor" does not exist to us. Samples which have proved poisonous give off odors which are usually almost putrefactive or are at least more or less indicative of protein decomposition. There is, however, so little agreement in nomenclature of smells that the presence of a definitely abnormal odor should be sufficient to condemn the product.

Inoculation experiments in the laboratory yield concordant testimony. Signs of decomposition, as some combination

of gas, odor, turbidity of liquor or disintegration are perceptible by the time toxicity has developed sufficiently for large doses to kill a guinea pig. The times and temperatures required to develop toxic conditions have been found sufficient to reduce the danger of botulism to negligible in opened foods in a well-conducted household.[8] Inoculated cans of food yield in the main concordant results. Although vague possibilities of danger remain, the practice of discarding all food in which signs of decomposition are perceptible is clearly a substantial safeguard if intelligently followed. Careful study of published and unpublished "case" reports confirm the belief that such precautions would have prevented nearly all the deaths concerning which our records are reasonably adequate.

RESTRICTION

The second main question, "How may we limit the number of cases when a botulism outbreak occurs?" is clearly bound up with the discussion already given. The moves open to the food or health official are limited by the particular law under which he operates. A clear understanding of those limitations should be obtained by him in advance of the emergency. This discussion will be limited to the lines of action we have found most useful.

1. When botulism is suspected, the first move advisable is a careful examination of all food left on the premises. This will include all remnants, partially emptied containers, empty cans, garbage, and everything in the storeroom or the ice-box. All should be examined and all material connected with the meals of the preceding days should be gathered and preserved against loss. Where other material is unsatisfactory, feces and post-mortem material should be included.

2. This may be followed immediately by such an epidemiological study as the Ohio[9] and Michigan[10] authorities gave to the cases reported by them. Such a study of the entire history of a case or series of cases usually fairly quickly narrows the possibilities of food as a source of poisoning to one or few kinds.

3. The materials presumptively incriminated by this study should be examined by the nearest properly equipped bacteriological laboratory. Feeding experiments with guinea pigs, rabbits, or white mice (in about that order of preference) are essential in establishing toxicity. These may be conducted by any competent pathologist without waiting for the results of bacteriological examination. Thus the responsible product, if even a few cubic centimeters of it are obtainable, may be fairly quickly located. Graham[11] considers that feeding chickens in addition gives the quickest presumptive differentiation between type A of the *B. botulinus* group which produces limberneck, and type B which in ordinary doses does not affect the chicken. Cultural examination should begin as quickly as possible and include both aërobic and anaërobic tests. The isolation and identification of *B. botulinus* follows lines marked out fully by recent workers.[12] Ultimately, feeding is the final proof of the identity of this organism.

4. Meanwhile the sources of all suspected materials should be found and all possible details of handling determined. If, as in certain recent cases, the containers are identifiable as parts of particular batches with identifying marks, every possible agency, state or national, should be enlisted in the task of removing that particular lot from the market. Scrutiny of whole series of batches from a particular source for evidence of extensive spoilage is frequently necessary and may result in preventing further outbreaks. In the surveys made by the Microbiological Laboratory of the Bureau of Chemistry, dangerous containers of food have been found only in lots in which many other spoiled samples were also found. Conversely, therefore, the presence of appreciable numbers of spoiled samples in a batch calls for careful study

of the entire lot with several administrative lines of action open.

5. Publicity and Embargoes. No producer or dealer can be assumed to have sold poisonous products knowingly. Public charges against the good faith of packer or dealer can rarely be sustained by evidence, but ignorance of the dangers involved in handling spoiled or partially spoiled food is widespread. If a particular sample of a known brand is shown to be dangerous, means should, therefore, be found to prevent the further sale or use of that lot of material. For the most part, the full coöperation of the food distributer is usually gladly given under these conditions. Embargoes of brands or of particular lots are dangerous measures, since, if once placed, their withdrawal is equivalent to certification that the products are safe. Intelligent coöperation between the investigator, the food distributer and the public is much more practical since by this means all suspected products may be immediately withdrawn from consumption during the period necessary for adequate examination. Wherever such examination discloses spoilage in material degree, steps should be taken to destroy the samples obviously spoiled and to reprocess or test adequately the materials not showing decomposition.

Transformed into concrete suggestions, responsibility for food poisoning, in so far as canned goods are concerned, rests about equally upon the dealer and upon the household. Every dealer should be made to feel a direct and positive obligation to remove from sale any can of food which shows sign of spoilage, and to condemn as dangerous and return to the packer any lot in which spoilage appears in considerable percentage. Correspondingly, some one, at least, in every household, should definitely understand the dangers of spoiled food, canned or uncanned, make intelligent examination of all food bought and apply discriminating care to all food stored in the home.

As a basis for propaganda to eliminate the danger of poisoning cases, this discussion leads directly to a series of recommendations which may be given the widest publicity.

a. Clean, fresh, sound food will not cause botulism.

b. Food freshly heated to the boiling point will not cause botulism.

c. Recooking is advised whenever opportunity for microbial activity has been given, but only before spoilage becomes evident by appearance, odor or taste. Food showing signs of decomposition is potentially dangerous, hence physical evidence of spoilage should lead to destruction, not to salvaging.

d. Intelligent coöperation of packer, dealer, and householder in the examination of food before it reaches the table is essential to the prevention of botulism.

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EDITORIAL SECTION

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THE BETTER PART OF VALOR

Varying comments, for the most part encouraging, have been elicited by the resolution adopted at the November meeting of the American Public Health Association, which condemned the indiscriminate multiplication of specialized national health agencies when existing organizations could be made to serve the ends in view. From the standpoint of purely mechanical efficiency the action can, of course, meet with nothing but approval.

The process of elimination and integration had not yet proceeded far enough to warrant predictions as to its success in the near future. But the pressure of circumstance will inevitably accelerate it, as it has stimulated in the field of religious organization the supplanting of the cutthroat competition of inadequate, part-time denominational chapels by the so-called community church. It is, in reality, a far-sighted policy of "enlightened selfishness" enunciated in the resolution. As *Better Times,* organ of the local welfare agencies in New York City, has recently pointed out, the question is ultimately one of coöperation or extinction for the volunteer health agency dependent upon private subscriptions. Coöperation in the fullest sense of the term includes the elimination of superfluity or duplication in any form. It is the public, long-suffering but kind, to which organized public health must look for the sinews of war. The temper of that public will not remain indefinitely complaisant in support of an army of competing health organizations. We may look for an increasing disposition to demand results and an increasing impatience of the inefficiency of separatism, as Mrs. Cannon has warned us in the *Atlantic.*

And with this is involved the problem of presenting a united front when seeking the favor of this same public. No giver, whether of large or small means, enjoys being approached by a score of different organizations, all working

in the same broad field. Here again, common action and a united financial campaign is a counsel of wisdom which is favored by every passing day. It is a welcome note that the A. P. H. A. has sounded, and one which should find response in all disinterested workers for the health of the people.

NEW BLOOD IN THE PUBLIC HEALTH SERVICE

A bill, S. 2764 and H. R. 9261, has been introduced in both houses of Congress and is now before committees providing for the reorganization of the United States Public Health Service and the promotion of its efficiency by the transfer, after a suitable examination, of not more than 550 officers of the Reserve Corps of the Public Health Service, including fifty dental surgeons and fifty non-medical scientists, to the regular commissioned corps of the Service.

The necessity for such action is shown by the expansion of the total personnel of the Service from 2,044 to 15,095 between July, 1917, and May, 1921, although the number of regular commissioned officers actually decreased from 212 to 199. Every one is familiar with the program which has necessitated this expansion: the tremendous task undertaken by the Service under the provisions of the Veterans' Bureau Act, by which disabled ex-service men become the care of the Public Health Service; the increase in quarantine functions by the acquisition of quarantine facilities in all parts of the United States where quarantine stations are maintained; the expansion of the merchant marine threefold within six years, with a proportionate rise in the number of marine-service patients under the care of the Public Health Service; and numerous new duties in connection with immigration, interstate disease control, and coöperation with state and municipal health officials. The small band of regular officers of the Service have struggled valiantly to organize and carry on a work which has expanded enormously in size, complexity, and scope.

The infusion of new blood into the Service by such legislation, the admission of other types of health experts, and the placing of the Service upon an equality with other government services in matters of tenure, pay and allowances, retirement, etc., are other by-product advantages. No increase in appropriations will be necessary for carrying out the provisions of the bill.

AN EXPLANATION

In the report of the Committee on Full-time District Health Officer Legislation of the Conference of State and Provincial Health Authorities, which appeared in the October issue of the JOURNAL, it was stated that it was impossible to present a complete report, owing to the negligence of four members of the Conference (including the New Brunswick Department of Health), from whom no replies to the questionnaire were received.

Dr. Eugene R. Kelley, chairman of the Committee which made the report, wishes to make public the following facts to which Dr. George G. Melvin, present chief medical officer of the Department of Health of New Brunswick, has called attention: The two requests for information from New Brunswick sent out by the Committee were addressed to Dr. Roy H. Magrath as secretary of the Provincial Board of Health. Dr. Magrath has not been secretary since October 1, 1918, and because the questionnaires were addressed to the previous incumbent they never reached the office of the Department. Dr. Magrath's name was unfortunately the last one reported to the secretary of the Conference of State and Provincial Health Authorities as secretary for New Brunswick, and was printed as such in the report of the proceedings of the Conference for the year 1919.

ASSOCIATION NEWS

RESOLUTIONS OF THE SEMI-CENTENNIAL MEETING

In accordance with a recent policy of the Association, the Resolutions Committee at the Fiftieth Annual Meeting thoroughly winnowed the grist of resolutions proposed and presented only a very few important statements for the consideration of the Association as a whole. The following were adopted in this manner without dissent:

RESOLUTION ON MULTIPLICATION OF NATIONAL HEALTH SOCIETIES

WHEREAS, The extensive multiplication of highly specialized independent national health societies threatens to become a hindrance rather than a help to public health; be it

RESOLVED, That the members of the American Public Health Association be urged to discourage the formation of new national health organizations when it appears that any existing agency can be made to meet the purpose.

RESOLUTION ON THE PROPOSED GORGAS MEMORIAL INSTITUTE

WHEREAS, The late William Crawford Gorgas, surgeon-general of the United States Army, freed Havana and the Panama Canal Zone of yellow fever and malaria, thereby saving thousands of lives and making possible the construction of the Panama Canal; and

WHEREAS, The work of the late General William Crawford Gorgas was an epoch in the field of medical science and a milestone in the work of public health throughout the world, in effect proving conclusively that health, even in the tropics, is a purchasable commodity under scientific guidance and administration; and

WHEREAS, It is the desire of the American people to join with the peoples and governments of Central and South America in paying tribute to the memory of General Gorgas, and the proposed Gorgas Memorial Institute, which will be erected in the City of Panama, represents the most fitting way to perpetuate the work of General Gorgas and to render the greatest good to humanity, with its possibilities for the saving of tens of thousands of human lives and the making available of hundreds of thousands of square miles of land for habitation and cultivation by white people; and

WHEREAS, The Republic of Panama, in expression of its gratitude to the late General Gorgas, has already donated the site, the buildings and all necessary equipment for the proposed Gorgas Memorial Institute, representing approximately $500,000; and there is yet required an endowment fund of from three to six millions of dollars to maintain and carry on this great work; therefore, be it

RESOLVED, That the American Public Health Association, assembled in its Semi-centennial convention in the city of New York, November 17, 1921, go on record as heartily endorsing the proposed Gorgas Memorial Institute and that the president of the Association be requested to appoint a committee of five to coöperate with the officers and directors of the proposed Gorgas Memorial Institute.

The president appointed the following committee of five to coöperate with the officers and directors of the Gorgas Memorial Institute: Dr. William H. Welch, chairman, Dr. Wickliffe Rose, Dr. Henry F. Vaughan, Dr. Edwin O. Jordan, and Dr. A. T. McCormack.

RESOLUTION ON COMMISSIONING OF SANITARY ENGINEERS

(Passed by the Sanitary Engineering Section and approved by the entire Association.)

WHEREAS, Sanitary engineers have a definite and distinct place in the work of the United States Public Health Service in stream pollution, control of water supplies on interstate carriers, malaria control, rat-proofing for plague control, and sewage disposal investigations; and

WHEREAS, The work which has been done by the sanitary engineers of the Public Health Service, particularly in sanitation

and malaria control of extra-cantonment areas during the war has been of great importance in safeguarding health and conserving lives of civilians and of soldiers; and

WHEREAS, The present status of the sanitary engineers in the Public Health Service is unsatisfactory because there is no permanency of position, no established recognition in law of the place of the sanitary engineer; and

WHEREAS, The Public Health Service can not maintain an adequate and efficient corps of sanitary engineers under the present unsatisfactory status, due to resignations from the Service; now, therefore be it

RESOLVED, by the American Public Health Association at its semicentennial meeting, that this Association approves H. R. 7541, a bill introduced in the United States House of Representatives by Mr. Sweet on July 1, 1921, to commission sanitary engineers in the Public Health Service on the same basis as the medical officers in the regular corps of the Service, and that this Association authorizes its president to appoint a committee from among its members to attend the hearings on this bill before Congressional committees and to urge the favorable consideration and passage of this bill at an early date by Congress.

RESOLUTION OF THANKS TO DR. JACQUES BERTILLON

The Vital Statistics Section, in deep appreciation of the work of Dr. Jacques Bertillon, secretary-general of the International Commission for the Revision of the International List of Causes of Sickness and Death, and as evidence of its love and esteem, has transmitted to Doctor Bertillon the resolution illustrated below, which was unanimously adopted by the Section at the recent meeting:

AMERICAN PUBLIC HEALTH ASSOCIATION

SECTION ON VITAL STATISTICS

Dr Jacques Bertillon, Paris, France.

WHEREAS, Dr. Jacques Bertillon has served for over twenty years as the Secretary-General of the International Commission which has recently made the third decennial revision of the International List of Causes of Death

WHEREAS, Dr Jacques Bertillon is recognized the world over as the father of international nosologic nomenclature,

WHEREAS, Dr. Jacques Bertillon, though in ill health, has recently carried through successfully the arduous labors connected with the third decennial session of the Commission already referred to,

BE IT RESOLVED, That the Vital Statistics Section of the American Public Health Association express to Dr Jacques Bertillon, Secretary-General of the International Commission for the Revision of the International Classification of Causes of Sickness and Death, appreciation of his untiring efforts to procure comparable international statistics of sickness and mortality, and extend to him the good wishes of the Association for his rapid and complete recovery.

Unanimously adopted:
November 16, 1921,
New York City

Eugene Lyman ... CHAIRMAN.

Robert E. Coffin ... SECRETARY.

LIST OF NEW MEMBERS

Proposed for Election to the A. P. H. A. November 1 to November 31, inclusive.
Names of Sponsors are set in **Bold Face Type.**
Names of New Members are set in Light Face Type.

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Charles H. Lerrigo, M. D., 1317 College Ave., Topeka, Kans. Registrar Vital Statistics for Kansas.

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Adam S. Knight, M. D., Oak Hill Ave., Attleboro, Mass. Supt. and Resident Physician Bristol Co. Tuber. Hospital.

MICHIGAN

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Mr. F. Gardner Legge, Jr., Dept. of Health, Detroit, Mich. Sanitary Engineer.

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Mr. Kenneth Allen, New York, N. Y.
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Mr. Homer N. Calver, Washington, D. C.
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C. E. Riggs, Capt. M. C., U. S. Navy, U. S. S. Great Northern.
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Mr. Harold Balliet, Dept. of Public Works, Buffalo, N. Y.
Mr. Stephen W. Bateson, Dept. of Public Safety, Buffalo, N. Y. Chief Food Inspector, Dept. of Public Safety.

OHIO

James E. Bauman, M. D., Columbus, Ohio.
Harry H. Snively, M. D., Columbus, Ohio. Dir. of Health, State of Ohio.

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Raymond C. Colwell, Johnston, R. I.
Mr. Harold A. Faulkner, 75 Fifth St., E., Providence, R. I. Asst. Bacteriologist.

Stephen DeM. Gage, Providence, R. I.
Miss Edith Earle, 49 Nichols St., Cranston, R. I. Asst. Chemist, R. I. State Bd. of Health.

VIRGINIA

H. E. Miller, Raleigh, N. C.
Roy P. Bishop, 1st Lt. Corps of Eng., U.S.A., Camp Humphreys, Va. Civil and Sanitary Engineering.

Mosby G. Perrow, Ph. D., Lynchburg, Va.
Mr. Lee H. Williamson, Charlottesville, Va.

WASHINGTON

Eugene R. Kelley, M. D., Boston, Mass.
Paul A. Turner, M. D., 216-19 Douglas Bldg., Seattle, Wash. Dir. of Health.

CANADA

Dr. D. A. McClenahan, Hamilton, Ont.
Mr. J. G. Cunningham, 252 Hillcrest Drive, Toronto, Ont. Full time, Prov. Board of Health.

MEXICO

Dr. Alfonso Pruneda, Mexico City, Mexico.
Dr. Francisco Castillo Najera, Mexico City, Mexico.

Dr. Diego Meza, Mexico City, Mexico.
Jose J. Rojo, D. D. S., Av. Francisco 1, Madero 69, Mexico, D. F.

EMPLOYMENT BUREAU

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 10th of each month for publication on the 20th. Mail to Boston office as early as possible.

In answering keyed advertisements, please mail replies separately to editorial office in Boston, Mass. In replying give age, professional training, salary requirements, previous positions held and three or more references.

Wanted: A colored worker for visiting T. B. families. One with T. B. experience preferred. Address Dr. Albert Robin, Executive Secretary, Delaware State Tuberculosis Commission, 213 West 7th Street, Wilmington, Del.

Wanted: Sanitary engineer to take charge of Division of Sanitary Engineering of State Department of Health of Middle West state. Experience necessary, opportunity unusual. Applicant should state full particulars of education and experience, together with references. Salary for first year, $2,400. Address 474, care of this JOURNAL, New York address.

Wanted: Resident physician for hospital for communicable diseases. Must be unmarried. Salary $1200 per annum with complete maintenance. Give full particulars as to age, nationality, training and experience. Address communications to Superintendent, Sydenham Hospital, Baltimore, Md.

POSITIONS WANTED

Positions wanted announcements will henceforth be carried in this column. The charge is $2 per insertion. Copy should be received at this office by the 10th of the month.

Wanted: Qualified sanitarian, recent graduate of Harvard-Technology School of Public Health, wants position. Experience in public-health work prior to taking C. P. H. degree. District health officer, northern Maine district, one year. Division director, Main State Department of Health, two years, preceded by nineteen years' general medical and surgical practice, including four years city dispensary service, four years medical inspector of schools and six years neurologist to Central Maine General Hospital. Best of references furnished. Now open to engagement. Address 192, H. E. H., care this JOURNAL, New York address.

Wanted: Position by a competent bacteriologist in commercial, state, or city laboratory. Have had extensive experience in bacteriological and chemical laboratories. Will be available immediately and go anywhere. Prefer a permanent place with moderate salary. Married. If you need an honest, conscientious man who tries to produce class-A work and can furnish best of references, write or wire M. S. Tarpinian, care this JOURNAL, New York address.

Wanted: Dairy, milk, and food inspector, fourteen years' experience, also trained in laboratory analysis and diagnostic work, assistant sanitarian, U. S. P. H. S. (Reserve). At present director, Food Inspection Division of Health Department in Southern city of 50,000. Satisfactory references furnished. Address 196 H. J., care of this JOURNAL, New York address.

BOOKS AND REPORTS REVIEWED

Fasting and Man's Correct Diet. *R. B. Pearson, Construction Engineer. Chicago: Published by the author. 1921. Pp. 153. Price,* $1.75.

The author of this book assails the doctrines (1) that germs cause disease; (2) that drugs cure disease; and (3) that a person must eat to keep up his strength. He resents that "allopathic doctors are trying to get their members in all public offices where they can increase the sale of their devilish serums." He concludes an attack upon vaccinations of all kinds with the gentle statement that "our modern so-called 'health' officers are daily making greater efforts to 'compel' everyone to take these damnable poisons."

The author commends fasting as a panacea for the ills of the flesh, since natural hunger will come to persons who fast until their systems are clean. In experimental work upon himself he kept no record of his weight, nor did he keep an exact record of the length of his fasting periods, the longest of which he describes as continuing between twenty-five and thirty days. During this period he was extremely weak, but exposure to cold did not result in any infection, neither did mosquito or hornets' bites cause inflammation. Toothache was cured and "teeth with black cavities became white and clean." He interpreted this as indicating that "germs were losing their hold." At the end of his fast he had been cured of intestinal catarrh and previous fasts had cured catarrhal deafness.

The author believes that "the hot weather diet should comprise about 300 to 350 calories." He has not read sufficiently to realize that 300 calories is the quantity of food required during twenty-four hours by a sleeping infant weighing eleven pounds. If he had visited the Army Medical Museum in Washington he would there have realized the scourge of septicemia among the wounded during the Civil War before the days of antiseptic surgery. If he had known of the ravages of typhoid among the troops at Montauk Point after the Spanish War, in contrast with the freedom from typhoid during the World War, he would not have been misled regarding the value of typhoid vaccination. Also, he should have contemplated the relation between excellent nutrition and resistance to tuberculosis. This was exemplified during the World War by the enormous increase in tuberculosis in Germany and especially in Austria. In our own country the poor of the cities were never so well nourished, and tuberculosis greatly decreased. Ought not one, therefore, "eat to keep up his strength?"

GRAHAM LUSK.

✚

Laboratory Manual in General Microbiology. *Prepared by the Laboratory of Bacteriology and Hygiene, Michigan Agricultural College, under the direction of Ward Giltner. New York: John Wiley & Sons, 1921. Second Edition. Illustrated. Pp. 472. Price, $3.50.*

It is now approximately six years since the appearance of this *Laboratory Manual.* In spite of the war the science of microbiology has advanced sufficiently to make a new edition of the *Manual* imperative. The most important changes in the new edition are: (1) The use of Fuller's scale has been abandoned. (2) The use of the autoclave, rather than flowing steam, in sterilization, is recommended. (3) The more recent views regarding the reaction of media involving the determination of PH have been given consideration. (4) The sections dealing with soil, water and sewage bacteriology have been almost completely rewritten. (5) Important alterations have been made in the section on pathogenic bacteriology.

The *Manual* is extremely helpful to the student in conjunction with the study of Marshall's *Microbiology.* There is a liberal explanatory text to make the *Manual* much more than a mere questionnaire. The chapter dealing with hydrogen-ion concentration is written very admirably in contrast with the muddled description of this subject one often finds in other students' text-books. It is rather surprising, however, that in the chapter dealing with the preparation of media the student is still taught to adjust the reaction by the old titration method.

ARTHUR LEDERER, M. D.

PUBLIC HEALTH NOTES

Abstracts by D. Greene, M. D., James A. Tobey and Homer N. Calver.

National Health Council Lecture Course.—Complying with the request of some of its members the National Health Council on December 1st, 1921, initiated a course of lectures on the organization and services of health agencies.

The opening lecture was given by Dr. Lee K. Frankel, vice-chairman of the National Health Council and former president of the A. P. H. A. Dr. Frankel spoke on the "Romance of Public Health Work," and dwelt on the purpose of the course and its value. He sketched the history of the public-health movement in this country, and showed the enormous gains which have already been made in the various fields of health work. The increased span of life, the decreased toll from preventable disease and the promise of still further gains were brought out most effectively.

In the second lecture, Dr. Donald B. Armstrong, executive officer of the National Health Council, gave an outline of the scope of the course and the topics which would be covered in the description of the agencies.

The outline calls for a description of each organization under the following heads: 1, Organization; 2, Services; 3, Affiliations (with official and voluntary agencies); 4, Membership (number and type of each); 5, Finances; 6, Plans for immediate future (what is to be emphazised).

The lectures are given each Thursday during the months from December to April and cover 26 national organizations in the field of public health, each talk being given by an executive of the organization, as follows:

Dec. 1, The Romance of Public Health, Dr. L. K. Frankel.

Dec. 8, National Health Council, Dr. D. B. Armstrong.

Dec. 15, American Public Health Association, A. W. Hedrich.

Dec. 15, American Society for Control of Cancer, Frank J. Osborne.

Jan. 22, American Red Cross, Homer N. Calver.

Dec. 29, American Social Hygiene Association, Dr. W. F. Snow.

Jan. 5, National Child Health Council, Courtenay Dinwiddie.

Jan. 5, American Child Hygiene Association, Dr. Richard A. Bolt.

Jan. 12, Child Health Organization of America, Miss Sally Lucas Jean.

Jan. 12, National Child Labor Committee, Owen R. Lovejoy.

Jan. 19, National Organization for Public Health Nursing, Miss Elizabeth Fox.

Jan. 26, National Committee for Mental Hygiene, Dr. F. E. Williams.

Feb. 2, National Tuberculosis Association, Dr. Charles J. Hatfield.

Feb. 9, State and Provincial Health Authorities of North America, Dr. Eugene R. Kelley.

Feb. 16, American Medical Association, Dr. Wendell C. Phillips.

Feb. 23, U. S. Public Health Service, Surg. W. C. Billings.

The official agencies and the various foundations will be discussed from March 2 to March 16 and a number of voluntary agencies not Council members will be taken up on March 23 to April 6. The schedule follows:

March 2, Children's Bureau, Miss Grace Abbott.

March 2, Veteran's Bureau, Col. Chas. R. Forbes.

March 9, International Health Board of the Rockefeller Foundation, Dr. Wickliffe Rose.

March 9, Carnegie Corporation, (speaker to be announced).

March 16, Russell Sage Foundation, E. G. Routzahn.

March 16, Milbank Memorial Fund, J. A. Kingsbury.

March 23, National Committee for the Prevention of Blindness, E. M. Van Cleve.

March 23, League for Nursing Education and American Nurses Association, Miss Clara D. Noyes.

March 30, American Association of Physicians and Surgeons in Industry, Dr. C. E. Ford.

March 30, American Conference on Hospital Service, American Association of Hos-

pital Social Workers, American Hospital Association, Dr. Michael M. Davis.

April 6, Y. M. C. A.—Y. W. C. A., Dr. Anna L. Brown.

April 6, Metropolitan Life Ins. Co., Dr. A. Fleisher.

The course closes on April 13 with summaries by Dr. Armstrong, Dr. Frankel and Dr. Snow.

✣

Present Status of Cancer Mortality.—The latest picture of cancer mortality in the United States is presented in a letter recently received from Dr. Frederick L. Hoffman, which gives the estimates for 1920 by race and sex, organs and parts, as follows:

The total approximate mortality was 90,000, of which 37,116 were deaths of males, and 52,884 were deaths of females. Of this number 85,883 were deaths of white persons, while 4,117 were of colored.

Under organs and parts, cancer of the buccal cavity caused approximately 3,339 deaths of which 2,775 were males and 564 were females.

Cancer of the stomach and liver caused 34,293 deaths, of which 17,317 were deaths of males and 16,976 were of females.

Cancer of the peritoneum, intestines and rectum caused 11,980 deaths, of which 5,141 were males and 6,839 were females.

Cancer of the female generative organs caused 13,671 deaths, of which 12,401 were deaths of white women, and 1,270 were deaths of colored women.

Cancer of the breast caused 8,369 deaths, of which 132 were males, and 8,237 were females.

Cancer of the skin caused 3,169 deaths, of which 2,045 were males and 1,115 were females.

Cancer of other organs and parts caused 15,188 deaths, of which 9,706 were males and 5,483 were females.

The question arises as to what hope there is for a decrease in mortality from this disease, and a chart recently prepared by Dr. Hoffman as statistician for the Prudential Insurance Company of America shows that since 1916 there has been no increase in the cancer mortality rate, but rather a slight, though significant, decrease. Annual fluctuations of a minor nature are noted, but in general the curve has been arrested and is now headed downward. This is the most encouraging indication noted since the organization of the Cancer Society and leads us to hope that by more intensive and extensive work throughout the country, a still further decline in the mortality curve may be effected.—*Bulletin, American Society for Control of Cancer,* Sept., 1921. (*D. G.*)

✣

Experimental Inoculation with Diphtheria Bacilli.—The authors summarize the results of their extensive investigations as follows: "(1) The carrier state was easily produced in human beings by inoculation of the throat with a virulent diphtheria bacilli. (2) When thus produced the carrier state lasted for a long time, two of the carriers still harboring avirulent diphtheria bacilli after fifteen months. (3) The previous administration of diphtheria antitoxin subcutaneously did not prevent the lodgment and growth of the organisms. (4) Inoculation of avirulent diphtheria bacilli into the throats of human beings did not produce: (*a*) clinical diphtheria; (*b*) any subjective symptoms; (*c*) any objective change in the appearance of the throat. (5) The results of the guinea-pig test for virulence were confirmed when thus tested with human beings. (6) No cases of clinical diphtheria developed among the associates of these artificially produced 'healthy carriers' of avirulent diphtheria bacilli. (7) When isolated in pure culture after prolonged sojourn in the human throat the bacilli were not altered in morphology or in their staining or cultural characteristics. (8) The bacilli showed no tendency to become virulent as a result of this type of animal passage, either in the carriers who had received diphtheria antitoxin or in those who had not. (9) Spraying the nose with gentian violet in a strength which could be tolerated seemed to be without effect in eradicating avirulent diphtheria bacilli." The following are the conclusions of the investigators: "(1) Avirulent diphtheria bacilli retain their characteristics despite long residence in the human throat or transfer from one human being to another. (2) Avirulent diphtheria bacilli are devoid of pathogenic importance for man. (3) The carrier of avirulent diphtheria does not constitute a menace to the health of the community."—Moss, Guthrie and Marshall, *Johns Hopkins Hosp. Bulletin,* xxxii, 37, Abstr., *Amer. Jour. Med. Sci.,* July, 1921, 136. (*D. G.*)

A Portable Disinfector.—The author describes a portable disinfector particularly useful in rural districts which provides efficient disinfection with increased mobility and at a low cost. The apparatus is so light and readily packed that a light model can readily be carried on a pedal bicycle, while a heavier model can be conveyed on the back carrier of a motor cycle. It is stated to be capable of effectively disinfecting 1½ tons of textiles in six hours; 120 single blankets in an hour, and 150 pounds of underclothing in 15 minutes. This active disinfecting capacity is produced at a very small expenditure of oil from an oil stove. The capital cost of the whole apparatus is stated to be very small in comparison with that of the most modest of the ordinary steam disinfectors now in general use.—F. E. Wynne, *Medical Officer*, Oct. 8, 1921, 157. (*D. G.*)

✣

Personal Cleanliness Scheme for School Children.—Dr. E. M. Wyche, in his latest annual report to the city of Nottingham, points out that it is possible to secure the necessary improvement in cases of uncleanliness through the medium of a printed notice, friendly in tone, helpful in suggestion and avoiding any reference to the authority's legal powers. By means of a series of such notices, commencing with one of friendly type, following up with others of graduated severity, and terminating with the final statutory notice under the Children Act, Dr. Wyche has proved that it is possible to combat uncleanliness in an area with the minimum of friction between the visitors and the parents. His series of graduated warning notices is as follows:

First Notice.—I feel sure that you will be distressed to learn that the hair of your child (named below) contains nits, and I would like you clearly to realize that I share your anxiety to free the child of this objectionable condition.

I advise you to plait or tie back the hair and treat it daily in the manner described on the back of this form. You may rest assured that regular and careful treatment according to these directions will speedily cleanse the hair.

Second Notice.—Your attention is again drawn to the fact that the hair of your child (named below) contains nits. It is my duty to require you to cleanse the child's hair forthwith.

Nits are the eggs of lice, and so long as they are present the hair is in danger of becoming verminous.

The child's hair must be plaited or tied back while in school, and you are advised to do this also at any time when he or she is likely to mix with other children.

Regular and careful treatment according to the directions on the back of this form will speedily cleanse the hair.

Third Notice.—Important.—Sec. 122 of the Children Act, 1908.

With reference to your child,
I have once more to inform you that on her hair still contained
If you fail to cleanse her to my satisfaction within seven days from the date of this notice it will be my painful duty to report t' is case for proceedings under Section 122 of the Children Act, 1908.
Statutory Notice under Children Act, 1908.

CHILDREN ACT, 1908. CLEANSING OF CHILDREN

Statutory Notice to the Parents or Guardians of .....
Date.....

I am directed by the Education Committee to inform you that the above-named child's head body clothing are unclean within the meaning of Sec. 122 of the Children Act, 1908.

On the back of this notice you will find directions for properly cleansing h

I hereby give you notice that you must properly cleanse h person and clothing within three days after receiving this notice.

If you fail to do so, your child will forthwith be cleansed by the Education Committee's officers.

Dr. Wyche points out that the success of a cleanliness scheme depends very largely upon the following essential provisions:

(*a*) The regular and frequent inspection (by nurses or trained uncertificated assistants—preferably the latter) of all children in the schools;

(*b*) The rigid following up of each case found to be below the accepted standard of cleanliness, until the child is either clean as the result of the parents' efforts or has been cleansed by the committee's officers;

(*c*) Active coöperation by the health de-

partment in the storing of clothing, cleansing of home premises, etc.;

(*d*) Complete control of visitation by the school medical officer in such a manner that at any moment he may have before him the full and up-to-date cleanliness record of any child within his area; and

(*e*) A central school career cleanliness record for each child.—*Medical Officer*, Oct. 29, 1921, 190. (*D. G.*)

✚

Claims for Leprosy Cure Premature.—The U. S. Public Health Service has felt it necessary to prevent the too optimistic and extravagant claims recently appearing in the newspapers in regard to the curative effects of chaulmoogra oil derivatives on leprosy. While the use of the oil and of its derivatives has resulted in a considerable number of apparent cures, it is as yet too soon to tell whether these will be permanent.

The ethyl esters of chaulmoogra oil, the use of which has largely supplanted the oil itself, constitute a most valuable agent in the treatment of leprosy. In treating young persons and those in the early stages of the disease, the improvement has been rapid and striking; in older persons and older cases it is less so. Of the cases paroled from the leprosy stations in the Hawaiian Islands so far, about eight per cent have relapsed and returned for treatment. This was to be expected; and on the whole the results have been so favorable as to make treatment of the disease hopeful. But only time can tell.

✚

National Health Council Report on Woman's Bureau.—The fourth of the National Health Council reports on the health activities of the United States Government was issued on November 1, 1921. This was a report on the Women's Bureau of the United States Department of Labor. It outlines the history and development of this bureau and summarizes its scope, organization and activities. The other reports of the Council were as follows: The Division of Vital Statistics, United States Bureau of the Census (June 1, 1921); Health Activities of the United States Government (with chart) (July 1, 1921); and the Children's Bureau of the United States Department of Labor, August 1, 1921. The last-named report should be of great interest to health workers at this time on account of the increased importance accorded to the Children's Bureau by the passage of the Sheppard-Towner Maternity and Infancy Bill, which became a law on November 23, 1921.

✚

Malaria and the Lost Cities of Ceylon.—The physical degeneracy of the descendants of the Northern Indians who invaded Ceylon in the sixth century, B. C., is attributed to malaria by Lucas Nicholls, a writer in the *Indian Medical Gazette*, April, 1921. The author illustrates his paper by beautiful photographs of sculptured rocks which reveal the high state of mental culture and physical vigor which characterized these people in ancient times. He believes from the climatological evidence that malaria was a new disease introduced into the island by the Indian invaders. It attained great virulence later by the aid of vast irrigation works. The author seems to think that now nothing can be done to cope with the disease but to let the forces of nature evolve a solution of the problem.—Cited in *Public Health Engineering Abstracts*, Sept. 24, 1921. From *Tropical Diseases Bulletin*, August 15, 1921.—(*J. A. T.*)

✚

Government Need for Workers in Rehabilitation.—The United States Civil Service Commission states that there is urgent need for reconstruction assistants and aides in physiotherapy and occupational therapy, as trained nurses, and physicians, to serve in hospitals and other establishments of the United States Public Health Service and the Veterans' Bureau, in the care and rehabilitation of men injured in the World War. The Commission has announced that it will receive applications for these positions until further notice. The applicants will not be given written scholastic tests, but will be rated upon their education, training, experience, and physical ability.

The Commission points out the importance of filling these positions promptly with the best qualified workers available.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or from the secretary of the Local Board of Civil Service Examiners at the post office or custom house in any city.

✚

Examinations of the National Board of Medical Examiners.—The first examination

of the National Board of Medical Examiners under the new plan in Parts I and II will be held as follows: Part I, February 15, 16 and 17 (1922), inclusive. Part II, February 20 and 21 (1922), inclusive. Applications for examination should be received no later than January 15, 1922. Application blanks and circulars of information may be had by writing to the secretary, Dr. J. S. Rodman, 1310 Medical Arts Building, Philadelphia, Pa.

✣

Red Cross Increasing Relief for Soviet Russia.—Medical supplies, one of the greatest needs in the famine stricken and disease-ravaged provinces of Soviet Russia, which are being supplied by the American Red Cross and distributed by the American Relief Administration, are being shipped in increasing quantities from the European stocks of the Red Cross and from the United States. By the end of December, 1921, Red Cross supplies valued at nearly $2,000,000 were sent into Soviet Russia to alleviate the suffering of tens of thousands.

Advices received at Red Cross headquarters in Paris from Dr. Henry Beeuwkes, directing the distribution of these Red Cross medical supplies in Russia, points out that typhus is prevalent in its most severe form and with the coming of winter will result in widespread and severe epidemics.

Malaria has been severe and is still prevalent in chronic form, Dr. Beeuwkes' report continues. He also points out that typhoid fever, diseases of the skin and eyes, and diseases directly traceable to the malnutrition general throughout the provinces are found in many instances. Constitutional diseases are severe and widespread.

"Drugs and hospital supplies are extremely scarce and satisfactory medical and surgical work is in consequence impossible. A leading surgeon in Simbirsk tells me that they draw thread from clothing to obtain suture material. Hospitals are congested and have long waiting lists," says Dr. Beeuwkes' report.

Outlining the medical work to be undertaken and the method of supply distribution, Dr. Beeuwkes says: "Present plans contemplate: the supply of existing hospitals and clinics with drugs and hospital supplies essential to their operation; the organization of clinics at food distribution centers in areas without medical facilities; inauguration of measures to prevent and combat diseases in areas in which relief is undertaken. In order to combat typhus, the Red Cross has in view the establishment of a large number of bath and disinfecting units to be installed and controlled by American personnel and operated by Russians. Installations will be simple and the cost low in comparison with the benefits they will render in areas badly infested and without bathing facilities."

✣

Mexico Holds a Health Exposition.—A children's week expositon celebrated in Mexico City recently was attended by more than 10,000 people. The principal departments visited were those where milk was hygienically sterilized, analyzed, and prepared for infant feeding. Many interesting exhibits were installed. Some of the subjects treated were prenatal care; milk; infant mortality; children's diseases; care of children as to daily program, feeding, clothing, teeth, and eyes; housing; and the rural child. Lectures on pertinent subjects were given both morning and afternoon.—*Pan-American Bulletin*, November, 1921. (*J. A. T.*)

✣

Public Health in Ireland.—A writer in the *Survey Graphic* of November 26, 1921, which is devoted entirely to Ireland, tells about public health in that country. He states that as regards preventive medicine, Ireland lags behind most civilized countries. The advance of public health has not kept pace with that of England. Few, if any, countries, however, have a more complete system of free medical treatment for the poor than has Ireland. For seventy years, since the passing of the Medical Charities Act, the poor may secure free medical attendance and medicine, and hospital treatment is also available. Nearly one half of the population is eligible for this free treatment. During recent years, sanatoria for the treatment of tuberculosis have been established and there are also asylums for the detention and care of lunatics and the feeble-minded. Practically every district in Ireland is provided with a trained maternity nurse. There are about two hundred visiting nurses in the country. A number of schemes for the diagnosis and treatment of venereal diseases are in operation.

The writer devotes some space to mak-

ing recommendations for improvements. He would centralize the control of public health, increase salaries of medical officers and establish a more efficient medical research.—New Health for Old, by Sir Edward Coey Bigger, M. D., *Survey*, November 26, 1921. (*J. A. T.*)

✚

Traveling Clinic in Slovakia.—A feature of the child welfare unit, which the Lady Muriel Paget Mission in Czecho-Slovakia is operating in conjunction with the League of Red Cross Societies, is the automobile clinic which travels through the country. This clinic, or traveling dispensary, began its work last May and in three months covered over 3,000 miles, serving eleven villages, where about 2,000 children have been treated.

The staff consists of one Czecho-Slovak and two English nurses, a Slovak interpreter and the driver. The clinic is held by the local doctor, or, in cases where there is none, by the doctor from the nearest village.

Upon arriving at a village where the clinic is to be held, a schoolroom is transformed as quickly as possible into a waiting and weighing room and a doctor's room and dispensary, by means of the screens, tables, medicine trays, etc., carried on board the lorry. The mothers are ranged sitting at long tables, with baskets hanging from the tables in front of them, and soon their babies, wrapped up like little mummies in their mattresses and many ribbons, are slowly unswathed on the table, the clothes going into the respective baskets and so kept apart. The babies enjoy the release, for they have frequently been carried for fifteen miles on their mothers' backs and have not been unwrapped for six hours. After being weighed, the mothers carry them into the doctor's room with their weight charts, and the doctor prescribes for them, and has a talk with each mother. They are then taken back to undergo the same process of mummification again, and their long pilgrimage over the hills starts once more.

The traveling clinic accomplishes a twofold task. It undertakes immediate relief work, which is of inestimable value, as it frequently goes to villages which are many miles away from the nearest doctor or chemist and where the inhabitants, when seriously ill, generally die for want of proper care. But even more important is the work of instruction carried on by this dispensary on wheels. Within three months more than 1,000 mothers have been taught how to wash and feed their infants and how to nurse them when sick. It is difficult to over-estimate the value of this instruction in a country where ideas on these subjects are less than rudimentary.—*Bull. League of R. C. Societies*, Sept., 1921.

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Wanted: A Unified Command.—Those who have witnessed the attempts in the last few years in this country to create a national department of public health which would conduct all federal health activities will be interested to note an expression of sentiment on a similar matter in England. The *Medical Officer*, speaking of the local situation, says, "Public-health committees, Poor Law guardians, general practitioners, hospitals, dispensaries and voluntary organizations of every type are enlisted in the same task. With so gigantic an effort along the whole battle front, it behooves us from time to time to take stock of our position, to examine the disposition of our forces and to determine whether at any point we can husband our resources."

This periodical apparently does not entirely favor for England the plan that is at present so popular in the United States, for it says, "We can too easily beguile ourselves and darken counsel by the use of those overworked shibboleths 'correlation' and 'coöperation.' In the late war there was doubtless correlation and coöperation between the different commands in France, but victory did not come until there was unity of command. It will be so with the health of the school child. The preservation of health, whether in infancy, childhood, adolescence or adult life is a unity; it cannot be divided by any artificial line of separation into component parts."

The English stand on the relation of school medical inspection to the health department is equally positive. "The time is now ripe for a reconsideration of the present position. The work of the school medical service is suffering from its disassociation from the general health service of the country, both centrally and locally. In the interests of efficiency and economy alike, there should be but one central authority and one

local health committee, dealing with all the phases of preventive medicine. In the war against disease there may be separate general staffs, but for victory there must be unity of command." It is significant that the trend of thought in the two countries is so nearly parallel.—*Medical Officer,* Nov. 12, 1921.

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LEGISLATION—FEDERAL

PROGRESS ON MATTERS PREVIOUSLY CONSIDERED

(From bi-weekly reports of the National Health Council, November 2-23, 1921)

S. 1039. Bill for Promotion of Welfare of Maternity and Infancy Becomes a Law.—The Sheppard-Towner bill for the promotion of the welfare of maternity and infancy, which passed the Senate on July 22, 1921, passed the House of Representatives on November 19, 1921, by a vote of 279 to 39. The Senate concurred in the House amendments on November 21. Ever since its adoption by the Senate in July, this measure has been before the House Committee on Interstate and Foreign Commerce, where extensive hearings were held. It was favorably reported to the House on November 14, 1921, with several amendments. The bill was signed by the President on November 23, 1921.

This law may be summarized as follows:

(a) Besides an appropriation of $50,000 for administrative purposes, it gives $10,000 outright to each state of the union to be used for the protection of maternity and infancy for the fiscal year ending June 30, 1922. $5,000 is to be paid each state annually thereafter for five years.

(b) Subject to qualifications $1,000,000 is to be given to the states for the fiscal year ending July 30, 1922, and $1,000,000 annually thereafter, for five years. Deducting administrative expenses and the sum given outright, $710,000 remains as the amount allotted to states on a population basis. This proportion must be matched dollar for dollar by each state in order to obtain the grant.

(c) A board of maternity and infant hygiene is created, consisting of the Chief of the Children's Bureau of the Department of Labor, the Surgeon General of the United States Public Health Service and the United States Commissioner of Education.

(d) The Children's Bureau is charged with the administration of the act and its chief is named as executive officer, empowered to promote an efficient administration of the act. This bureau makes the apportionments to the various states. The bureau of child hygiene in the state health department administers the act in the state.

(e) State agencies must make reports concerning their plans and operations to the Children's Bureau. Authority is given to the Bureau to withhold certificates of payment of federal funds if states do not comply with the conditions of this law.

(f) Officials and agents of the several states are restricted from entering homes or taking charge of children over the objection of their parents.

The principal changes made in this bill over the one originally introduced (see Statements No. 2, p. 10, A. P. H. J., July, and No. 14, p. 12) are as follows:

The title is changed from "Protection of Maternity and Infancy" to "Promotion of the Welfare of Maternity and Infancy." The appropriation is now limited to five years and a definite amount of $10,000 for the first year and $5,000 annually thereafter is given outright to each state. A Board of Maternity and Infant Hygiene with definite duties is created instead of an advisory committee. The amount for administrative expenses for the Children's Bureau is increased from 3 to 5 per cent of the appropriation. Appeal to the President if certification by the board is withheld is provided for.

Interesting discussion of this bill will be found in the Congressional Records of November 18 and 19.

H. R. 7294. Final Enactment of Willis-Campbell Anti-Beer Law. Adoption of the conference report on this measure, forbidding the manufacture and sale of medicinal beer, by the Senate on November 18, 1921, by a vote of 56 to 22, and its signature by the President on November 23, 1921, brought its enactment into a law. Previous to signing the bill, President Harding referred it for report to the treasury department, which had recently issued lengthy regulations for the distribution of beer on a physician's prescription (see Statement No. 14, p. 3, A. P. H. J., December). The Secretary of the Treasury promptly gave

his endorsement to the proposed act. A summary of the provisions of the law as finally adopted in both houses of Congress follows:

(a) The bill prohibits the prescribing of beer or malt liquors for medicinal purposes.

(b) Not more than one-fourth of a gallon of vinous liquor, or vinous or spiritous liquor separately or in the aggregate containing more than one-half of a pint of alcohol may be prescribed in ten days.

(c) Physicians are limited to 100 prescriptions in ninety days unless extraordinary reason is presented.

(d) The commissioner may cancel or require change of permits to manufacture patent medicines and preparations used as a beverage, even if they are unfit for beverage use, or require the formula for making extracts to be changed, or may cancel the permit, if it appears to the commissioner that the sale or use of such articles is substantially increased by reason of their use for beverage purposes.

(e) Importation of spiritous or vinous liquor is prohibited until the amount on hand shall not be sufficient to supply the current need for non-beverage purposes.

(f) Spiritous liquors exported in the original packages may be reimported in such packages for redeposit in the distillery warehouse from which originally removed.

(g) The courts of Hawaii and the Virgin Islands are given jurisdiction to enforce the National Prohibition Act.

(h) Regulations to carry this act into effect are authorized.

(i) Revenue laws relating to the manufacture, taxation of and traffic in liquor shall remain in effect when not in conflict with the national prohibition act, and the prohibition taxes and tax penalties provided in the national prohibition act shall be collected in the same manner as other taxes on liquor.

(j) Taxes on liquor stolen or destroyed shall not be collected from the owner if the loss or theft did not occur as a result of his negligence, connivance, collusion or fraud on the part of the owner or person legally accountable for the same.

(k) Private residences may not be searched without a search warrant. Officers who without probable cause enter and maliciously search any place without a search warrant are penalized. Persons who impersonate officers enforcing the prohibition act are heavily penalized.

S. 2668. $16,000,000 Appropriation for New Hospitals Presented to Senate. Introduced by Senator Ashurst on October 20, 1921. Referred to the Committee on Appropriations. This bill is a duplicate of the measure introduced in the House of Representatives by Mr. Langley October 21, 1921, (H. R. 8791) providing for an appropriation of $16,000,000 for the construction of hospital facilities for veterans. The bill stipulates that $500,000 shall be used in the extension of U. S. Public Health Service Hospital Number 32, in the city of Washington. The purpose of the introduction of the bill in the Senate is to facilitate its passage through both houses. (See Statement No. 14).

S. 2764. To Promote Efficiency in the U. S. Public Health Service. Introduced by Senator Watson of Indiana, November 22, 1921. Referred to the Committee on Finance. This proposed legislation is similar to the measure introduced in the House (H. R. 8566) by Mr. Dyer on October 10, 1921. (See Statement No. 13, p. 5, A. P. H. J., December). It provides for the commissioning in the regular service of five hundred and fifty officers of the Reserve Corps of the United States Public Health Service. A system of promotions without any change in the present pay is established. A provision fixes the term of the Surgeon General at four years and limits his selection by the President from the commissioned personnel of the service. Seven professors of the hygienic laboratory are authorized and the organization of a corps of nurses, of dietitians and reconstruction aids is inaugurated. A complete outline of the officers of each corps with the pay for each is among the important features of the measure.

H. R. 7883. Mental Clinics for D. C. Juvenile Court. Adverse Action in House. This bill, having been favorably reported on July 28 (see Statement No. 10, p. 9, A. P. H. J., October), was brought up in the House on November 14. The bill provided for mental and physical examination and study of persons brought before the Juvenile Court of the District of Columbia. It was discussed at some length. Finally, on motion of Mr. Bankhead, the bill was re-

ported back to the House with the recommendation that the enacting clause be stricken out. The effect of this was to kill the measure.

NEW LEGISLATION

Coördination of Federal Hospitals. Bureau of the Budget, Treasury Department, Circulars Nos. 44 and 45. On November 1, 1921, Director Charles G. Dawes of the Bureau of the Budget, issued an order for the purpose of coördinating the separate hospitalization activities of the government. The hospitals of the following bureaus would be affected:

Medical Department of the Army, Bureau of Medicine and Surgery of the Navy, Public Health Service, St. Elizabeth's Hospital, National Home for Disabled Volunteer Soldiers, Office of Commissioner of Indian Affairs, U. S. Veterans' Bureau.

On November 3, Mr. Dawes appointed Brigadier General C. E. Sawyer as Chief Coördinator. General Sawyer will also be president of a federal board of hospitalization, the members of which are the heads of the bureaus listed above.

The duties of this board are to:

(a) Consider all questions relative to the coördination of hospitalization of the departments represented.

(b) Standardize requirements, to expedite the interdepartment use of existing government facilities, to eliminate duplication in the purchase of supplies and the erection of buildings.

(c) Formulate plans designed to knit together in proper coördination the activities of the several departments and establishments, with a view to safeguarding the interests of the government and to increasing the usefulness and efficiency of the several organizations, and to report to the President thereon.

S. J. Resolution 130. Erection of Monument to General Gorgas in the District of Columbia. Introduced by Senator Heflin of Alabama, October 20, 1921. Referred to Committee on Library. This measure appropriates $50,000 for the erection of a suitable monument in the city of Washington to Major General William Crawford Gorgas, in memory of the services he rendered to humanity.

H. R. 9046. Limiting Amount of Water to be Withdrawn from Lake Michigan for the Sanitary District of Chicago. Introduced by Mr. Michaelson, November 9, 1921. Referred to the Committee on Rivers and Harbors. In order to prevent the pollution of the waters at the southern end of Lake Michigan and to divert the sewage and drainage from Lake Michigan, this measure limits the amount of water that can be drawn by the Sanitary District of Chicago, to not more than an average of ten thousand cubic feet of water per second for each calendar year.

For compensation for any lowering of water in the Great Lakes due to such withdrawal, the Sanitary District must pay the United States the reasonable cost of maintaining the water levels.

To care for any excess of population over 3,000,000 the Sanitary District must install sewage purification works.

District of Columbia Bills. H. R. 8955. Regulation of Sale of Milk and Cream in the District of Columbia. Introduced by Mr. Focht, November 1, 1921. Referred to the Committee on the District of Columbia. The bill prohibits the sale of raw milk and cream in the District unless it is certified or has been properly pasteurized under the supervision of the health office of the District by being held at a temperature of not less than 142 degrees Fahrenheit nor greater than 148 degrees, Fahrenheit. There is a penalty attached for violation of the proposed law.

S. 2702. Support and Maintenance of Illegitimate Children in District of Columbia. Introduced by Senator Ball November 9, 1921. Referred to the Committe on the District of Columbia. This bill confers upon the Juvenile Court of the District of Columbia and the Supreme Court of the District the power to compel fathers to support illegitimate children. A heavy penalty is provided in cases of violation of the act. The courts are given the right to suspend sentences in case delinquents repent and make proper payments for support and maintenance of their illegitimate children.

H. R. 9237. First Deficiency Appropriation for 1922. Introduced by Representative Madden, November 21, 1921. Favorably reported to the House by the Committee on Appropriations, Nov. 21, 1921. Passed the House of Representatives November 22, 1921, with a few minor amendments. This

measure contains several items of interest to public health. The main one is an appropriation of $25,000,000 to the U. S. Veterans' Bureau for medical and hospital services. A sum of $40,000,000 is also included for vocational training. A summary of the appropriations dealing with health matters follows:

(a) For continuing construction of Gallinger Municipal Hospital in Washington, $150,000.

(b) For vocational training in U. S. Veterans' Bureau, $40,000,000; for medical and hospital service, U. S. Veterans' Bureau, $25,000,000.

(c) For U. S. Public Health Service to be used for medical, surgical and hospital service; for quarantine service; for freight and transportation, $635,000.

(d) For prevention of epidemics, $1,000.

(e) For support of Southern Branch of National Home of Disabled Soldiers at Hampton, Va., $106,500.

After its passage by the House, the measure went to the Senate to be taken up there at the December session.

LEGISLATION—STATE

Ohio.—By a unanimous decision on December 6, 1921, the Ohio State Supreme Court upheld the constitutionality of the Hughes Health Law (108 Ohio Laws, part 1, p. 236; Section 1261, et seq., General Code), and the Griswold Law (106 Ohio Laws, part 2, p. 1085) which amended it.

Two cases in mandamus—one by the village of Cuyahoga Heights and one by the city of West Park, both in Cuyahoga County—were heard together by the court. Both sought to compel the county auditor to issue his warrant upon the county treasurer for certain amounts of money held by him for the use of the Cuyahoga County general health district.

All questions of fact or technicalities were waived by agreement of counsel on both sides and the constitutional questions were before the court on their merits.

The Hughes law was approved May 9, 1919, and the Griswold Law was approved December 18, 1919, and together they abolished the system of city, village and township boards of health of which there were approximately 2,150. This system was replaced by two types of health districts, a municipal health district in cities of 5,000 population or more, and a general health district in each county in the state exclusive of cities in the county, making a total of 182 health districts. Under the old system there were but five or six full time health commissioners in the entire state. Under the new system there are at present 44 full time health commissioners.

The decision is one of the most important health decisions ever handed down by the Ohio Supreme Court. Speaking through Judge Johnson, the Court said:

"The General Assembly, in the exercise of the legislative power conferred by the constitution, has authority to enact general laws prescribing health, sanitary and similar regulations effective throughout the state; and to provide such reasonable classifications therein as may be deemed necessary to accomplish the object sought.

"The peace, morals, health and safety of the people are a matter of concern to the state, and when the state has enacted general laws providing sanitary and similar regulations effective throughout the state, the different subdivisions of the government may be required to contribute to the carrying out of the legislation."

The Ohio Public Health Association made it possible financially for the State Department of Health to employ special counsel to test the constitutionality of the law.

INDEX

The following compilation is more than an index; it is a history of all bills relating to public health and allied matters in Congress from April 11 to Nov. 16, 1921. It is arranged in three parts: (1) Senate Bills and Resolutions; (2) House Bills and Resolutions; (3) Subject Index. Under (1) and (2) the bills are given in numerical order. The data under each comprises: the number of the bill (as "S. 1607"); the subject of the bill (as "Department of Public Welfare"); name of member introducing it (as "Mr. Kenyon"); date introduced (as "May 5"), all dates being 1921; committee to which it was referred, (as "Education and Labor"); reference to Statement in which the bill is described (as "No. 3"); reference to Statements in which progress of the bill is given (as "Progress, No. 4, p. 2," etc.); issue of the AMERICAN JOURNAL OF PUBLIC HEALTH in

which statement appeared (as "A. P. H. J., July").

The Subject Index is arranged alphabetically. If a person is interested, for instance, in maternity and infancy, he turns to this subject under "M" and finds S. 1039 and H. R. 2366 cited. Then turning to S. 1039 in the proper chronological order under the Senate Bills, he finds that this bill was introduced by Mr. Sheppard on April 21 and was passed on July 22, noting its progress between those dates. If the data ends with the name of the committee to which the bill was referred, this means that no further action has been taken on it. All data has been checked against the index of the *Congressional Record*.

This compilation is believed to be the first attempt in the history of public health to collect complete information on the national health legislation of a session of Congress.

1. *Senate Bills*

S. 132. Sale of St. Louis Marine Hospital. Cited No. 2, p. 20. (A. P. H. J., July.)

S. 206. Prohibition of Exportation of Opium. Mr. Jones. April 12. Finance. No. 2, p. 14. (A. P. H. J., July.)

S. 321. Investigations of Fires and Dust Explosions in Industrial Plants. Cited No. 2, p. 20. (A. P. H. J., July.)

S. 408. Department of Social Welfare. Mr. Kenyon. April 12. Education and Labor. No. 2, p. 7. (See also S. 1607). (A. P. H. J., July.)

S. 525. Sanitary Reserve Corps in U. S. Public Health Service. Mr. Owen. April 12. Military Affairs. No. 2, p. 13. (A. P. H. J., July.)

S. 526. Department of Health. Mr. Owen. April 12. Appropriations. No. 2, p. 8. (A. P. H. J., July.)

S. 624. Regulation of Chiropractic, D. C. Mr. Fletcher. April 13. District of Columbia. No. 2, p. 18. (A. P. H. J., July.)

S. 749. Regulation of Osteopathy, D. C. Mr. Capper. April 13. District of Columbia. No. 2, p. 18. (A. P. H. J., July.)

S. 758. Prohibiting Experiments on Living Dogs, D. C. and Territories. Mr. Myers. April 15. Judiciary. No. 2, p. 19. Hearings, June 29. No. 8, p. 8. (A. P. H. J., Sept.)

S. 802. Incorporation of American Society for Control of Cancer. Mr. Wadsworth. April 13. Judiciary. No. 2, p. 16. (A. P. H. J., July.)

S. 810. Regulation of Practice of Medicine, D. C. Mr. Cummins. April 13. District of Columbia. No. 2, p. 17. (See also S. 2283.) (A. P. H. J., July.)

S. 812. Regarding Cold Storage Foods. Cited No. 2, p. 21. (A. P. H. J., July.)

S. 1039. Protection of Maternity and Infancy. Mr. Sheppard. April 21. Education and Labor. No. 2, p. 10. Hearings, May 5, No. 4, p. 3. (A. P. H. J., July.)

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S. 1084. National Budget. Mr. McCormick. April 25. Expenditures in Executive Departments. No. 8, p. 9. (A. P. H. J., Sept.)

S. 1109. Compensation for Injured Government Employees. Cited No. 4, p. 4. (A. P. H. J., July.)

S. 1198. New Hospital at St. Louis. Cited No. 4, p. 9. (A. P. H. J., July.)

S. 1497. Increasing Compensation for Totally Disabled Persons. Cited No. 4, p. 10. (A. P. H. J., July.)

S. 1565. Retirement of all Disabled Army Officers on Equal Terms. Cited No. 9, p. 9. (A. P. H. J., Sept.)

S. 1588. Prevention of Venereal Diseases, D. C. Hearings, Oct. 13 and 20. No. 13, p. 2. (A. P. H. J., December.)

S. 1591. Incorporation, D. C. Medical Society. Report, Nov. 4. No. 15, p. 8.

S. 1607. Department of Public Welfare. Mr. Kenyon. May 5. Education and Labor. No. 3. Progress, No. 4, p. 2. Hearings, No. 5, p. 2. Status, No. 10, p. 8. (A. P. H. J., July, Oct.)

S. 1616. Repression of Prostitution, D. C. Hearings, Oct. 13 and 20. No. 13, p. 2. (A. P. H. J., December.)

S. 1718. Tobacco for Ex-service Hospital Patients. Cited No. 11, p. 5.

S. 1839. Department of Public Welfare. Mr. McCormick. May 18. Education and Labor. No. 5, p. 9. (A. P. H. J., July.)

S. 1882. Honest Merchandise Act. Mr. Lodge. May 20, Interstate Commerce. No. 6, p. 6. (A. P. H. J., Aug.)

S. 1887. Extending Food and Drugs Act. Mr. Calder. May 20. Interstate Commerce. No. 6, p. 7. (A. P. H. J., Aug.)

S. 1890. Division of Construction and Housing in Bureau of Standards. Cited No. 6, p. 8. (A. P. H. J., Aug.)

S. 1896. Department of Public Works. Cited No. 6, p. 8. (A. P. H. J., Aug.)

S. 1911. Extending Government Employees Compensation Law. Cited No. 6, p. 8. (A. P. H. J., Aug.)

S. 1944. Incorporating Light Houses for the Blind. Mr. Warren. June 2. Judiciary. No. 6, p. 7; No. 7, p. 8. (A. P. H. J., Aug.)

S. 1971. Care for Government Employees Stricken with Tuberculosis. Mr. Sheppard. June 6. Civil Service. No. 7, p. 10. (A. P. H. J., Aug.)

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S. 2083. Embalming and Undertaking, D. C. Mr. Ball. June 15. District of Columbia. No. 7, p. 11. (A. P. H. J., Aug.)

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S. 2257. Regulating Sale of Milk, D. C. Mr. Ball. July 13. District of Columbia. No. 9, p. 7. (A. P. H. J., Sept.)

S. 2283. Regulation of Practice of Medicine and Midwifery, D. C. Mr. Ball. July 19. District of Columbia. No. 9, p. 7. (A. P. H. J., Sept.)

S. 2300. Examination of Delinquents Before D. C. Juvenile Court. Mr. Ball. July 22. District of Columbia. No. 10, p. 9. (A. P. H. J., Oct.)

S. 2365. Municipal Surveys by Bureau of the Census. Cited No. 11, p. 5. (A. P. H. J., Oct.)

S. 2411. Vacation of Streets at Walter Reed Hospital. Cited No. 11, p. 5.

S. 2458. Hospital for Veterans Suffering from Mental Diseases. Mr. Stanley. September 21. Finance. No. 12, p. 5. (A. P. H. J., December.)

S. 2473. Protection Water Supply, Kaysville, Utah. Mr. King. September 22. Public Lands and Surveys. No. 12, p. 6.

S. 2547. Amendment Veterans' Bureau Act Concerning Permanent Disability. Mr. Robinson. Oct. 5. Finance. No. 12, p. 5.

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S. 2639. Columbia Institution for the Deaf. Mr. Pomerene. October 20. Education and Labor. No. 14, p. 10.

S. 2668. Appropriation for New Hospital for Veterans. Mr. Ashurst. October 20. Appropriations. No. 15, p. 4. (A. P. H. J., January, 1922.)

S. 2691. Conservation of Food in Interstate Commerce. Cited No. 15, p. 8.

S. 2702. Illegitimate Children, D. C. Mr. Ball. November 9. District of Columbia. No. 15, p. 7. (A. P. H. J., January, 1922.)

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S. Joint Res. 104. Army Medical Supplies for Famine Sufferers in Russia. Mr. King. Aug. 19. Appropriations. No. 11, p. 4. (A. P. H. J., Oct.)

S. Joint Res. 130. Monument to General Gorgas. Mr. Heflin. Oct. 20. Library No. 15, p. 6. (A. P. H. J., January, 1922.)

S. Res. 77. Investigation of Lobbying Activities. Mr. King. May 12. Judiciary. No. 5, page 11. Hearings, No. 8, page 7. Report, No. 9, page 5. S. Res. 59. Investigation of Soldier Relief. Mr. Walsh. June 9. Passed. No. 7, page 9. (A. P. H. J., July, Aug., Sept.)

S. Res. 93. Investigation of Bureaus and Agencies Caring for War Veterans. Mr. Sutherland. June 13. Audit and Control of Contingent Expenses. No. 8, p. 6. Hearings. No. 10, p. 6. (A. P. H. J., Oct.)

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H. R. 7. Department of Education. Mr. Towner. April 11. Education. No. 2, p. 7. (A. P. H. J., July.)

H. R. 19. Vocational Training for Widows of Ex-service Men. Mr. Newton. April 11. Education. No. 2, p. 12. (A. P. H. J., July.)

H. R. 21. Vocational Education for the Civil Population. Mr. Fess. April 11. Education. No. 2, p. 12. (A. P. H. J., July.)

H. R. 22. Promotion of Physical Education. Mr. Fess. April 11. Education. No. 2, p. 10. (A. P. H. J., July.)

H. R. 65. Prohibition Transportation of Poisons Without Labels. Mr. French. April 11. Interstate and Foreign Commerce. No. 2, p. 15. (A. P. H. J., July.)

H. R. 116. Issuance of Doctors' Licenses to Practice in all States. Mr. Mason. April 11. Interstate and Foreign Commerce. No. 2, p. 14. (A. P. H. J., July.)

H. R. 209. Dawson Springs, Ky., Sanatorium. Cited No. 2, p. 20. (A. P. H. J., July.)

H. R. 216. Incorporating Disabled American Veterans of the World War. Cited No. 9, p. 9. (A. P. H. J., Sept.)

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STATE HEALTH NOTES—GENERAL

California

During the past few years municipal and private automobile camps in California have increased in number until at the present time more than 160 cities maintain camps for the convenience of automobile tourists, and there are, in addition, at least 100 private camps throughout the state. While the establishment of such camps is a considerable factor in bringing business to the community and in attracting permanent settlers, their chief function lies in the provision, under supervision, of sanitary facilities for tourists, thus doing away with promiscuous camping on the outskirts of towns, with all of its disagreeable features. Through the establishment of organized, well-equipped camping places in definite locations, promiscuous camping along the state highways, streams, and on important watersheds is done away with, not through force, but simply through the provision of better facilities in selecting locations for camping in comfort.

Automobile traveling and camping have increased to such an extent during the past few years in California that the State Board of Health, in order to protect the health and comfort of the traveler, as well as of the communities through which he may travel, has adopted rules and regulations for their sanitary control.

✣

The Southern Pacific Company which handles the ferry service on San Francisco Bay is said to give more attention to the sanitation of its vessels than to any other problems except those directly involved in navigating the steamers. The boats of this company carried about 27,000,000 persons during the year 1920. This is an average of about 2,200,000 a month or about 74,000 a day.

The sanitation of the kitchens and dining rooms receives the utmost attention, and a staff of cleaners is constantly employed. On every steamer, the work of cleaning is assigned to individual members of the crew. Daily inspections are made by the captain to see that their duties are properly carried out. During the day, of course, only light work can be done so that all the heavy cleaning is done during the night after the boats have finished their day's work. During this latter period, the main deck is washed down, the outside of the boat is cleansed, all windows are cleaned and all other appliances are thoroughly scrubbed and disinfected. When time permits, the steamers are fumigated by means of sulphur. The purpose of this, of course, is to rid the boat of rodents.

Illinois

Of more than usual interest are the results of a recent investigation by one of the field physicians of the State Department of Public Health into a mild outbreak of typhoid fever at Mt. Carroll in Carroll County. The chain of epidemiological evidence pointed to a certain milk producer as the source of four or five cases. A laboratory examination of the dairyman's feces showed that he is an active typhoid carrier, although 43 years have elapsed since he was a typhoid fever victim.

✣

One of the most significant public-health events of the year in Illinois was the school of instruction for district health superintendents recently conducted by the State Department of Public Health in Springfield and Chicago. It was arranged and carried out primarily for the benefit of newly appointed state health officers, many of whom had no experience in public health service.

The session covered a period of seven days and was divided into two sections, one dealing with theoretical and one with practical phases of public-health administration. The theoretical courses were given in Springfield where the district health superintendents had the opportunity to visit the various divisions of the department and to become thoroughly familiar with the policies and methods by hearing lectures from the director and his division chiefs. For the practical course, the superintendents went to Chicago where the methods employed in administering public health are unsurpassed. There they visited various public clinics, hospitals, water purification and milk pasteurization plants, open-air schools, welfare centers and other institutions doing work of a public-health nature. They also had the privilege of seeing the Chicago health de-

partment in action with reference to communicable disease control methods, medical inspection of school children and dairy inspection.

✣

The widespread prevalence of diphtheria in Illinois has resulted in unprecedented demands on the State Department of Public Health for antitoxin and for diagnostic laboratory service. Requests for antitoxin have more than trebled during the last two months, while an unusually large number of diphtheria cultures has been received for laboratory examination. Very few requests for toxin-antitoxin have been received, although the Department is prepared to furnish it to physicians without cost. In reviewing the diphtheria situation the records show a considerably greater incidence at present than has been the case during any previous year since 1917. For the first nine months of this year, 11,016 cases were reported, as compared with 5,673, 5,440 and 6,659 for the same months in 1918, 1919 and 1920, respectively. Each month of the year has uniformly shown a greater incidence than corresponding months in the other years noted, and incomplete reports for October indicate that the same thing will be true for that month. At a number of places the situation has taken on epidemic proportions serious enough to cause the closing of schools. Many communities have called upon the Department for assistance of one kind or another, and many reports of quarantine violations have been received. All such cases are being investigated.

The Department furnishes antitoxin, toxin-antitoxin and diagnostic laboratory service to physicians free of charge. Approved mailing containers are also supplied on request. For the convenience of physicians branch laboratories are maintained at Chicago, Mt. Vernon, Moline, Ottawa, Urbana and Galesburg.

✣

In view of the continued prevalence of poliomyelitis in Illinois, the State Department of Public Health and the Department of Animal Pathology and Hygiene of the State University are coöperating in efforts to determine, if possible, whether or not a relation exists between cases of poliomyelitis among humans and of paralysis among farm animals. The study grew out of the fact that frequently cases of both are found on the same premises. In carrying out the investigation the Department of Health furnishes the University with information relative to the location of poliomyelitis cases while the University collects specimens of excretions and secretions for bacteriological and microscopic study. Up to the present time no post-mortems in poliomyelitis cases have been made for the reason that death reports have reached the state officials too late to carry out the necessary work prior to burial, and objections to disinterment usually arise. Plans to obtain immediate death reports in these cases are now being made, with the hope of accomplishing more extensive research work than has been heretofore possible. Those in charge of the investigation feel quite hopeful of reaching some interesting conclusions.

Indiana

Recently the aeroplane has been used in propagating the gospel of health in Indiana. Dr. Ada Schweitzer, director of the Division of Infant and Child Hygiene, of the Indiana State Board of Health, found she had accidentally made conflicting dates in her work. The town of LaGrange is in the northern part of the state of Indiana, bordering Michigan. In this town, the Infant and Child Hygiene Division, which is carried in automobiles over the state with its exhibits and general paraphernalia, was engaged for one week in September. Dr. Schweitzer's conflicting engagement was in the city of Sullivan, two hundred and forty miles from LaGrange, as the bird flies. Major Albert T. Rich, U. S. Army Instructor, Indiana National Guard, and Major Fagley, commanding the aero squadron, offered to carry Dr. Schweitzer. After fulfilling her engagement in LaGrange in the forenoon, she flew to Sullivan in time to keep her engagement for the evening at that place. The journey was begun at three o'clock in the afternoon and two hours and a half later was ended in Sullivan. Dr. Schweitzer's departure from LaGrange and her arrival in Sullivan were matters of great interest to the inhabitants and helped her materially in her work at Sullivan, where the public had been informed of her coming. A great crowd was gathered to witness the landing, and that

night the auditorium could not hold the masses that assembled to hear the public-health messages she bore. The aero authorities of Indiana's military organization have offered their services for public-health work in the future.

Kansas

The annual meeting of the Kansas Public Health Association was held in collaboration with the Kansas Conference of Social Work in Topeka December 6, 7 and 8. The sections on tuberculosis, public-health administration and social hygiene presented interesting programs. Steps are being taken for organizing a section on laboratories, a section on public-health nursing, and a section on mental hygiene. The next annual meeting will be held in October, 1922.

✚

The Kansas State Board of Health has put on an extensive program during the past three months, encouraging the immunization of school children to diphtheria by the use of toxin-antitoxin. In one county the entire school population was immunized, and in a large number of school districts, mostly in the cities, a successful program was consummated.

✚

The State Board of Health, in connection with the International Health Board, has offered assistance to six counties in the state for the purpose of putting on a full-time health demonstration, three counties having thus far been secured, and already there is widspread approval among the people of those counties for the full-time health organization work. These three counties, together with four others, previously operating, make a total of seven full-time health organizations in operation in Kansas.

✚

Cancer Week was quite generally observed throughout the state, the program for the most part being put on by the local county medical societies. Where the local society's interest could not be aroused, a successful program was put on by the local health departments. About 40,000 pieces of literature on the menace of cancer were distributed.

✚

Health Week, in coöperation with the Rotary Clubs of the state, was widely observed, the Rotary Clubs, in general, entering into the spirit of the occasion with the same pep and enthusiasm that has characterized Rotary from the beginning of this remarkable organization's existence. Altogether, it is thought that much good has been accomplished in an educational way.

✚

Kentucky

A National Health Exposition will be held in the Jefferson County Armory at Louisville, February 1-9, 1922. This is under the auspices of the United States Public Health Service, the State Board of Health of Kentucky, Jefferson County Board of Health and the Health Department of the city of Louisville. It will include exhibits in hospitalization, nursing, dentistry, medicine and pharmacy. The University of Louisville, the public school system, and various local, state and national health organizations will participate.

The annual conference of the city and county health officers, the annual convention of the Kentucky State Public Health Association and other health meetings are already scheduled in connection with the Exposition.

An institute will be conducted by the United States Public Health Service and its program will include:

Dr. M. J. Rosenau, dean of the Harvard School of Public Health; Dr. S. Josephine Baker, director of the Department of Child Hygiene, New York City Board of Health; Dr. Wm. A. Evans, former health officer of Chicago and the most distinguished public health editor in America; George T. Palmer, president of the Illinois Tuberculosis Association and director of the Bureau of Tuberculosis of the Illinois State Board of Health; Dr. Frederick E. Greene, secretary of the Council of Health and Public Instruction, American Medical Association; Dr. Valeria H. Parker, executive secretary of the Interdepartmental Board of Social Hygiene; Dr. John H. Stokes, distinguished syphilographer of the Mayo Clinic; Dr. Frankwood Williams, associate director of the National Committee for Mental Hygiene; Dr. W. S. Rankin, state health officer of North Carolina, a member of the Council of Health and Public Instruction of the American Medical Association and recently president of the American Public Health Association; Dr. John Dill Robert-

son, health officer of Chicago; Dr. John R. McDowell, director of health for the Lake Division, American Red Cross; Dr. John R. McMullen, United States Public Health Service, and Miss Frances Brink, of the National Organization for Public Health Nursing.

Expenses will be paid through the sale of commercial exhibit space to a limited number of reputable firms.

Michigan

The general death-rate of the state of Michigan dropped to 11.0 per 1,000 population during November and the infant mortality rate to 66.7 per 1,000 living births. This is the best standing the state has reached since last June, according to reports issued by the State Department of Health.

For the first 11 months of 1921 Michigan has maintained an average birth rate of 25.1 per 1,000 population, a general death rate of 11.8, and an infant mortality of 79.9. A total of 87,655 births and 40,475 deaths has been recorded up to Dec. 1.

Rural communities, representing 38 per cent of the state's population, have furnished 36 per cent of the total number of births and 41 per cent of the deaths. Urban communities represent 62 per cent of the total population. They have furnished 64 per cent of the births and 59 per cent of the deaths.

Except for unforeseen conditions, authorities say that 1921 will probably establish a health record for the state. General improvement is noted over 1920 when the general death-rate for the year was 14.0, the birth-rate 24.9, and the infant mortality rate 92.4.

Texas

The first whole-time medical staff employed by the University of Texas has recently made its first annual report. The staff consists of four physicians: Dr. C. W. Goddard, chief of staff; Dr. C. S. Gates, physician for men; Dr. Ethel Lyon Heard, physician for women, and Dr. S. N. Key, eye, ear and throat specialist, all of whom, with exception of Dr. Key, give their whole time to the University. Mrs. Minnie E. Clarke, secretary of the staff, and S. N. Ekdahl, sanitary inspector, complete its personnel.

Students are encouraged to report immediately all minor ailments to the medical staff, and, by doing so, it is believed that much sickness of a more serious nature has been prevented. Prompt attention is given to all contagious and infectious diseases, and quarantine and other measures enforced to prevent their spread. Careful attention is also given in each instance to avoid unnecessarily detaining students from attending classes on account of exposure to contagious and infectious diseases.

Complete physical examinations are made of matriculants upon entrance. A folder on which the examination is noted is made out for each student, and all subsequent services for the student are recorded on it. These records are kept on file and contain valuable statistics.

The medical staff established a system to improve the sanitation of all university buildings, grounds, fraternity and sorority houses, boarding and rooming houses, cafes, swimming pools, picture shows, and all other places where students congregate. The sanitary inspector makes regular inspections, files reports in writing to the chief of staff, and corrective measures are instituted where defects are found.

Attention was given to the eradication of mosquitoes, and a general clean-up campaign inaugurated in the university neighborhood. The staff invited the coöperation of the people of Austin, as well as the city officials, and met with a most cordial response.

It is desired on the part of the University that the students be developed and made stronger physically as well as mentally. The medical staff believes this is being done through the efficiency of the physical training departments, and by giving careful attention to the health of the students. The staff is coöperating in every way possible with the physical training departments. Students are given careful physical examinations and then classified for athletic and other physical training, according to conditions found. Special classified courses of physical training are prescribed for those found to have gross physical defects. Records on file show improvement of these defects in some of the students assigned to special physical training courses. Few exemptions from physical training were found to be necessary.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Presence of the Tubercle Bacillus in the Duodenal Fluid.—The author having ascertained by the use of the duodenal tube that the tubercle bacillus is present in the duodenum in advanced stages of tuberculosis, investigated the diagnostic value of the method in cases in which the bacteriological proof of the disease was not otherwise forthcoming. For this purpose 7 cases were examined, consisting of 4 cases of tuberculous peritonitis of the ulcerative or fibro-caseous form without intestinal disturbance, 1 case of Poncet's rheumatism, 1 case of encysted pneumo-thorax with emphysema and disseminated bronchitis without bacilli in the sputum, and 1 case of cervical and mediastinal ademitis, with fever resembling that of miliary tuberculosis. The result was positive in 3 cases. In another group, consisting of 11 patients in whom tuberculosis was probably not present, the results were constantly negative. The cases thus show that the tubercle bacillus may be eliminated by the bile and pancreatic juice even in cases where there are no bacilli in the sputum.—Carnot and Libert, *Bull. et Mém. Soc. Méd. des Hôsp. de Paris*, July 21, 1921; *Brit. Med. Jour.*, Oct. 8, 1921.

✚

Variations in the Normal Leucocyte Count.—The authors state that variations in the normal leucocyte count are due to numerous causes, such as the erect or recumbent position, examination of the blood from the finger or the ear, a state of fasting or digestion, apnoea or amplitude of the respiratory movements, each of these factors being sufficient to cause changes in the blood counts. During their service in the army, the writers made repeated examination of their own leucocytes from 8 A. M. to 8 P. M., as many as twenty-three examinations being made in the course of the day on the same person. They were leading at the time a quiet life, avoiding physical exertion and taking the ordinary diet of an officers' mess. Their results were as follows: (1) In the normal individual the number of leucocytes varies from one moment to another. (2) The variations are least marked the first thing in the morning, and are most pronounced between 3:00 P. M. and 9:00 P. M., when the total number of leucocytes may range from 12,300 to 6,500 in the course of half an hour. The different estimates relating to digestive leucocytosis are thus explained, for according to the hour, or rather the minute at which the blood is taken, there may be a leucopenia or a leucocytosis. The term "digestive oscillations" is therefore preferable to "digestive leucocytosis." (3) The normal polymorphonuclear percentage presents great variations, ranging from 47 to 73 per cent in one of the writers, and from 43 to 67 per cent in the other. (4) The polymorphism, frequency, and suddenness in the leucocyte changes in normal subjects should make one very reserved as to their interpretation.—Maurice and Cabouat, *Paris Méd.*, May 21, 1921; *Brit. Med. Jour.*, Aug. 27, 1921.

✚

Organisms of B. Lactimorbi Group Simulating B. Diphtheriae.—In normal and pathologic throats, organisms occur from time to time which under routine conditions so closely resembles *B. diphtheriae* as to cause possible confusion. These organisms may be readily differentiated even under these conditions, by certain constant morphologic characteristics, and when isolated spores and motility are seen.—Roger G. Perkins and D. S. Spreng, *Jour. Inf. Dis.*, 29, 513, (1921).

✚

Further Observations on a Rapid Method of Pneumococcus Typing.—The description of the original method appeared in the *Jour. Inf. Dis.*, 27, 310, (1920). In 100 consecutive, unselected cases of pneumonia, in all but two instances, a typing of the pneumococcus has been effected within from 30 to 40 minutes by the rapid precipitin method, which was checked by the longer cultural or mouse method. The substitution of inulin for dextrose, and the addition of Andrade indicator seems to possess certain advantages over the standard Avery cul-

tural method.—Wade W. Oliver, *Jour. Inf. Dis.*, 29, 518 (1921).

✚

The Occurrence of Hemolytic Streptococci in the Normal Throat.—Cultures taken at short intervals sooner or later reveal the presence of hemolytic streptococci in the throats of practically all normal adult persons. The cocci, as revealed by throat swabs are not numerous; far less, according to the author's experience, than in the crypts of tonsils or adenoids.—David J. Davis, *Jour. Inf. Dis.*, 29, 524 (1921).

✚

The Thermal Death-Point of the Human Intestinal Protozoan Cysts.—In a group of experiments, with the aid of the eosin-criterion of viability, the thermal death-point of the different cysts of the parasitic intestinal protozoa of man was determined as follows: Entamoeba histolytica, 68°C.; Entamoeba coli, 76°C.; Iodamoeba biitschlii, 64°C.; Endolimax nana, 64° C.; Giardia intestinalis, 64°C., and Chilomastix mesnili, 72°C. In quoting the above temperatures as the thermal death-points, it will be remembered that they are subject to a slight downward deviation of generally 2°C., since all the experiments upon each species of cysts did not end in a common thermal death-point. The remarkable resistance of all the protozoan cysts to the high temperature is quite analogous to that of the spores of bacteria; in both cases the thermal death-point is much higher than that of their respective vegetative and non-spore bearing stage.—William C. Boeck, *Am. Jour. Hyg.*, 1, 365 (1921).

✚

Changes in the Cerebrospinal Fluid in Early Syphilis.—The authors remark that the cerebrospinal fluid in the early stages of syphilis, even when there are no clinical nervous symptoms, shows changes similar to those found in cerebrospinal syphilis and general paralysis. As hitherto no systematic comparative investigations have been made correlating the changes in the cerebrospinal fluid with those in the central nervous system, the writers examined 31 cases, consisting of 4 of acquired syphilis in adults, 26 of congenital syphilis in infants, and one foetus, with the following results: When the cerebrospinal fluid was positive, changes were found in the central nervous system, especially the meninges; the spinal cord was always normal, though in one case meningeal infiltrations were found over the cerebellum and in another case over the cerebral hemispheres. In children the Wassermann reaction was more frequently positive than in adults when lymphocytosis was scanty or absent.—Koenigstein and Spiegel, *Wien, Klin. Woch.*, June 16, 1921; *Brit. Med. Jour*, Aug. 20, 1921.

✚

Nonprotein Nitrogen in Nephritis.—Chronic nephritis with hypertension and uremia is characterized by a marked increase in the amount of the nonprotein nitrogen substances in the blood and a low phthalein excretion. Chronic nephritis of moderate degree with hypertension is associated with a moderate increase in the amount of waste nitrogen in the blood and a lessened kidney function. Cardiac inefficiency without nephritis is associated with a moderate retention of the nonprotein nitrogen substances in the blood, more particularly the uric acid. In chronic nephritis with clinical and anatomic evidence of disease there is nitrogen retention and renal inefficiency. The presence of albumin and casts in the urine is not necessarily diagnostic of nephritis, nor is their absence necessarily indicative of the nonexistence of such disease. Improvement of the circulatory disturbance is accompanied by a decrease in the various introgenous extractives of the blood, more particularly the uric acid, and this may suggest that at least a part of the damage done the kidneys is a sequence of the alterations in its nutrition brought about by passive hyperemia.—J. Lisle Williams, *Arch. Int. Med.*, 28, 426 (1921).

✚

The Sachs-Georgi Precipitation Test For Syphilis.—Heated serum should be used; unheated serums from positive cases may fail to cause precipitation in any concentrations. (A wide range of concentrations has been tested.) The concentrations of serum recommended should not be exceeded, since heated normal serums in large amounts—for example, 0.2 to 0.3 c. c.—may cause precipitation. No positive case has been met with in which the usual amounts of heated serum employed failed to show precipitate, but the reaction may be more marked with 0.05 c. c. of serum than with

0.1 c. c. The mixture must be kept at 37°C., as precipitate may form with non-syphilitic serums at lower temperatures. Sometimes, however, it is advantageous in the case of weak reactions to record results after the tubes have stood for thirty minutes further at room temperature, but the behavior of the negative control must be carefully scrutinized. The results should be controlled by including in each series of test known negative, weak and strong positive serums, just as in the case of the Wassermann reaction.—T. Taniguchi and N. Yoshinare, *Brit. Med. Jour.*, Aug. 13 (1921).

✣

Studies of the Chemistry of the Body in Diseases of the Skin.—In mild cases of eczema no disturbances were observed in the chemical composition of the blood nor in the condition of the hydrogen-ion concentration of the body fluids. In eczema accompanied by other metabolic derangement the deviation of the blood chemistry was due to the metabolic diseases, as, for example, diabetes. In the latter case conditions of acidosis were noticed. In severe diffuse eczema we observed a state of acidosis, an increased ethereal sulphate fraction in the urine, indicative, perhaps, of intestinal putrefaction, but otherwise a normal blood chemistry. No marked deviation in the blood chemistry, aside from hyperglycemia, was observed in cases of acne vulgaris. In cases of psoriasis the non-protein sulphur of the blood seemed to show larger figures than usual. In one case of xanthoma a marked increase of the blood cholesterol was observed. A mild acidosis seemed to accompany some of our cases of seborrheic eczema, psoriasis, acne vulgaris and urticaria.—Oscar L. Levin, and Max Kahn, *Am. Jour. Med. Sciences*, 162, 698 (1921).

✣

Test for Acetone in the Urine.—The author has worked out a simple method for quantitative determination of acetone in the urine: To 5 c. c. of the urine are added 5 drops of a saturated solution of sodium nitroprussid and then 1 c. c. of a 15 per cent solution of sodium hydroxid. The fluid turns red and then dark dregs-of-wine color as the fluid is at once neutralized by adding a few drops of concentrated acetic acid, and this tint persists for ten minutes. The test is then repeated with the urine diluted to 1:10. If the dregs-of-wine color fades out before three minutes, there is less than 0.05 per cent acetone in the fluid. The test is then repeated with dilutions of 1:5; 1:8, etc. If the tint fades out at 1:8 after three minutes, while this does not occur until the fifth minute with the 1:6 dilution, then the 1:8 dilution is the proper one. The formula is the product of the dilution figure and the acetone figure of 0.05. In this case it would be $8 \times 0.05 = 0.4$. Assuming the daily output to be 1,000 c. c., the acetone content would be 4 c. c. or 3.2 gm.—R. Scharf, *Med. Klinik* (Berlin), Sept. 4, 1921; *Jour. A. M. A.*, 77, 1691 (1921).

✣

Flocculation Tests for Syphilis.—The authors explain the reason for the difference between the response of active serum to the Wassermann test and the Sachs-Georgi test for syphilis. This they find is due merely to the difference in the salt content of the mediums. Adding a little more salt brings the response of the active serum to the same place with one technic as with the other.—H. Sachs and F. Georgi, *Med. Klinik* (Berlin), Aug. 14, 1921; *Jour. A. M. A.*, 77, 1690 (1921).

✣

Wildbolz' Auto Urine Reaction.—The authors give the results of their investigations on the Wildbolz auto urine reaction for the determination of the activity of tuberculosis. The concentrated urine of patients with active pulmonary tuberculosis (with positive tubercle bacilli findings) yielded in persons sensitive to tuberculin twenty-seven positive, and only one negative, reactions. But also with the urine of persons who did not offer the slightest evidence of tuberculosis (physicians, hospital personnel and patients with mild ills) they obtained thirty-seven positive and four negative reactions. They conclude that the auto urine reaction is caused essentially by the traumatic and chemical effects of the injected concentrated urine, and has therefore no value for the diagnosis of tuberculosis. Whether the urine of tuberculous subjects contains specific substances that, after elimination of disturbing factors (salt effect), have a diagnostic value, remains to be decided by further investigations.—G. Farago and P. Randt, *Deutsche Med. Woch. sch.*, 47, 919 (1921); *Jour. A. M. A.*, 77, 1455 (1921).

Standardizing Vaccines by Opacity Method.—The opacity method of standardizing vaccines is in Holker's opinion the most suitable for the practical work of a pathologic laboratory, in that it is simple, accurate and rapid. He independently worked out the method described by Don and Chisholm, but discarded it as not being convenient nor sufficiently accurate. He therefore worked out another method of measuring opacity which has proved not only accurate and rapid, but being a standard in itself, has had the advantage of not requiring any other standard such as a suspension of barium sulphate. This method is described in detail.—J. Holker, *Jour. Path. Bact.*, Edinburgh, 24, 419 (1921); *Jour. A. M. A.*, 77, 1604 (1921).

✣

Bacillus Proteus in Cerebrospinal Fluid in Typhus.—In both cases cited by the author, examination of bloom films for malaria parasites and spirilla or relapsing fever was negative. Agglutination tests with *B. paratyphosus*, A, B and C were completely negative. In both, a positive Weil-Felix with *B. proteus* X 19 was obtained. From the cerebrospinal fluid in each, an organism was grown which appeared to be *B. proteus*. No agglutinating serum for *B. proteus* was obtainable, and the classification of the organism is incomplete, but the tests done seem to warrant the conclusion that from a cerebrospinal fluid of two cases of typhus fever with meningeal signs, *B. proteus* has been isolated.—J. M. Anderson, *Jour. Path. Bact.*, Edinburgh, 24, 478 (1921); *Jour. A. M. A.*, 77, 1605 (1921).

✣

Fractional Analysis of the Duodenal Contents in Normal Individuals.—From observations on the fractional analyses of the duodenal contents in ten normal individuals, the authors feel justified in concluding that this method of examination presents a simple means of determining quantitatively the degree of alkalinity as well as the quantity of ferments present for several hours after the stimulation of the duodenal contents by means of a test meal. The degree of alkalinity is usually highest in the fasting state, and falls immediately after the test meal is given and then gradually rises; it bears no relation to the curve of gastric acidity. A similar effect is observed usually in regard to the ferments, the strength of one ferment being wholly independent of the other. Finally, these findings, obtained under normal conditions, appear sufficiently definite to serve as a basis for further study of pathologic changes in the duodenal contents.—Julius Friedenwald and Joseph Sindler, *Jour. A. M. A.*, 77, 1471 (1921).

✣

Colloidal Benzoin Reaction.—The authors state that further experience has confirmed the advantages of their colloidal benzoin technic as simpler than the colloidal gold test, while the findings are dependable and constant. They parallel the Wassermann reaction in neurosyphilis as a rule, and seem to be particularly instructive in the acute and subacute cases. When the findings varied from those with the Wassermann test in nonsyphilitic diseases, if there was any discrepancy it was always the Wassermann that was at fault. The reagent is a suspension of 1 gm. of benzoin resin in 10 c. c. of alcohol, set aside for two days, using only the decanted fluid. They bring the whole subject of colloidal hemolytic tests down to date.—G. Guillain, G. Laroche and P. Leschelle, *Presse Médicale*, Paris, 29, 773 (1921); *Jour. A. M. A.*, 77, 1528 (1921).

✣

Sterilization of Puncture Needles.—The author advises to use for venesection a steel needle sterilized by leaving it for an hour in chloroform containing 3 per cent paraffin. He says that the paraffin keeps the blood from sticking and the needle from rusting, while the chloroform sterilizes it effectually without affecting the temper, so that very fine needles can be used.—P. P. Levy, *Presse Médicale*, Paris, 29, 777 (1921); *Jour. A. M. A.*, 77, 1528 (1921).

✣

The Auto-Urine Test.—The author applied to tuberculosis the method of fractional analysis which he has worked out on urine, precipitating with lead acetate and then following with sodium phosphate. His tests failed to disclose any specific antigen in tuberculosis urine corresponding to the antigen like that in tuberculin. Hence he concludes that the Wildbolz auto-urine reaction cannot serve to distinguish between active and latent tuberculous processes.—M. Weisz, *Med. Klinik*, Berlin, 17, 930 (1921); *Jour. A. M. A.*, 77, 1532 (1921).

Simplified Test for Syphilis.—The author does not wait for flocculation to occur, as in the Sachs-Georgi and Meinicke tests, but gages the reaction by the turbid aspect of the fluid. This can be estimated in an hour or two, but he waits for four hours. The response harmonized remarkably with the usual syphilitic extracts (cholesterinized), diluted 1:10, and adds 0.4 c. c. of the serum to be tested; with alternating control tubes with known positive and known negative serum reactions for two-thirds of the set, as he describes.—H. Dold, *Med. Klinik*, Berlin, 17, 940 (1921); *Jour. A. M. A.*, 77, 1533 (1921).

✣

The Formalin and Sachs-Georgi Tests for Syphilis.—The author has studied the diagnostic value of two of the most recent syphilis tests, the Gate and Papacostas formalin test and the Sachs-Georgi precipitation test. In conclusion he says that the results obtained from the formalin test prove once again the futility of basing conclusions on figures derived from a small number of cases, as small series have recently been published showing complete concord between formalin and Wassermann reaction results. The technique of the test is simple, and were the results reliable, it would be an excellent method whereby the practitioner could rapidly establish a diagnosis of syphilis. But less than half of the serums giving positive Wassermann reactions shows coagulation with the formalin, and—a fact of yet greater importance—nearly 10 per cent of non-syphilitic serums give a positive result. Any claim to the reliability of the test is therefore demolished.

As regards the Sachs-Georgi test, the results obtained are distinctly promising. The technique is much simpler than that of the Wassermann reaction on account of the omission of the complement and other constituents of the hemolytic system. But this is rather more than balanced by the great difficulty of determining the presence or absence of a precipitate in many instances. A strongly positive Sachs-Georgi reaction may be taken as evidence of syphilis, but a weak reaction must at present be looked upon with suspicion because of the difficulty in distinguishing between the weakest positive reaction and the slight precipitation given by some negative serums. It appears possible, however, that the detection of the weakest positives may be made easier by modification of the antigen and by special methods of reading the results—W. N. Kingsbury, *Lancet*, Oct. 15, 1921. (D. G.)

✣

Purity of American Strains of B. Botulinus.—Nontoxic strains were isolated from 18 out of 19 so-called "strains" of B. botulinus examined. These nontoxic isolations were proved to be B. sporogenes. Isolations of B. sporogenes were made from stock "strains" of B. botulinus by four different methods, that is, by the use of anaerobic plates, simple dilution, aerobic plates with Staphylococcus aureus, and by heating in order to kill vegetative forms after the spores of B. sporogenes had been formed. The "strains" of B. botulinus examined resemble morphologically and in their action on meat mediums and milk pure cultures of B. sporogenes, except that the action of B. sporogenes is more rapid, and in some cases carried nearer to completion.—George E. Reddish, *Jour. Inf. Dis.*, 29, 120 (1921).

CONVENTIONS AND CONFERENCES

January 9-11, American Academy of Applied Dental Science, Stacey-Trent Hotel, Trenton, N. J.

January 10, West Virginia Public Health Council, Masonic Building, Charleston, W. Va.

January 16-21, Texas State Health Officers' Association, Adolphus Hotel, Dallas, Texas.

January 17, Massachusetts Association of Boards of Health, Boston, Mass.

January 18-19, American Society of Civil Engineers, 29 West 39th St., New York City.

January 24, Engineering Institute of Canada, Montreal, Canada.

February 24, Wyoming Public Health Association, Plains Hotel, Cheyenne, Wyo.

Medical Lib

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